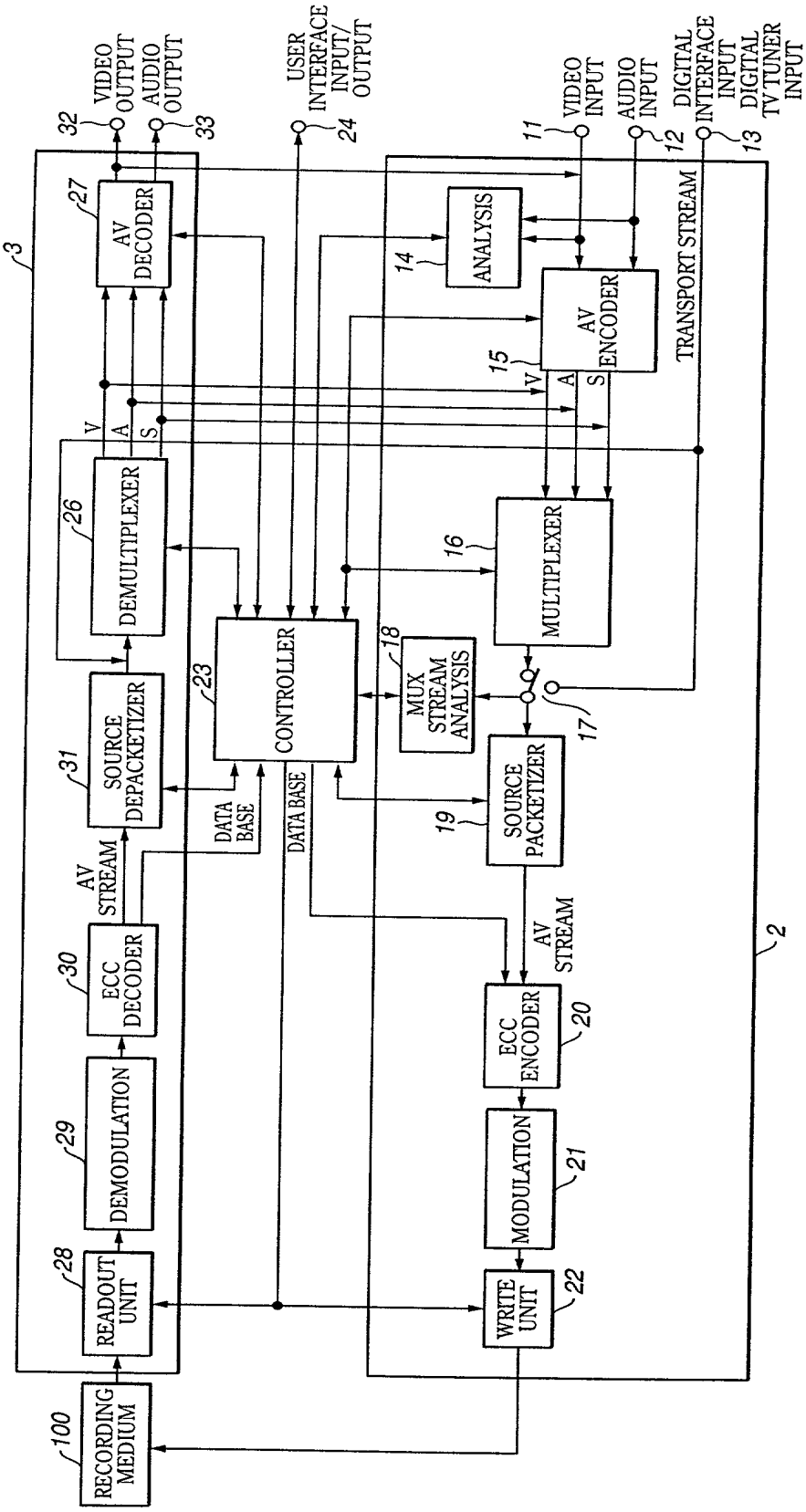

RECORDING MEDIUM
100
READOUT UNIT
28
DEMODULATION
29
ECC DECODER
30
AV STREAM
SOURCE DEPACKETIZER
31
DATA BASE
DEMULTIPLEXER
26
V
A
S
AV DECODER
27
VIDEO OUTPUT
32
AUDIO OUTPUT
33
3
CONTROLLER
23
DATA BASE
MUX STREAM ANALYSIS
18
SOURCE PACKETIZER
19
AV STREAM
ECC ENCODER
20
MODULATION
21
WRITE UNIT
22
2
USER INTERFACE INPUT/ OUTPUT
24
ANALYSIS
14
MULTIPLEXER
16
17
AV ENCODER
15
V
A
S
TRANSPORT STREAM
VIDEO INPUT
11
AUDIO INPUT
12
DIGITAL INTERFACE INPUT
13
DIGITAL TV TUNER INPUT

FIG.1

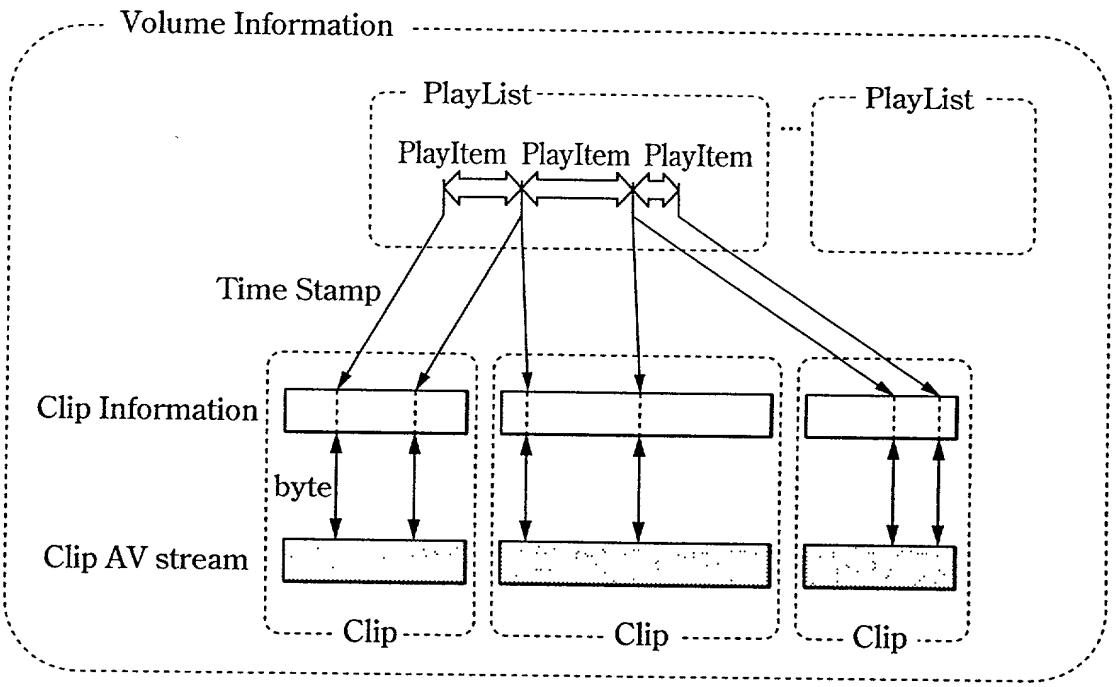

Volume Information
PlayList
PlayList
PlayItem PlayItem PlayItem
Time Stamp
Clip Information
byte
Clip AV stream
Clip
Clip
Clip

FIG.2

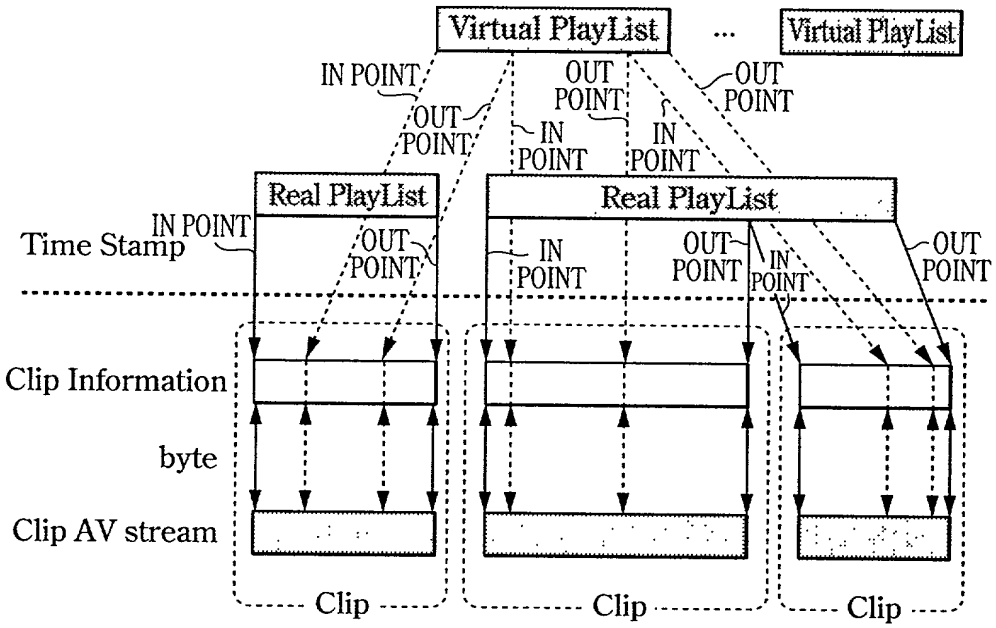

Virtual PlayList
...
Virtual PlayList
IN POINT
OUT POINT
OUT POINT
OUT POINT
IN POINT
IN POINT
Real PlayList
Real PlayList
IN POINT
Time Stamp
OUT POINT
IN POINT
OUT POINT
IN POINT
OUT POINT
Clip Information
byte
Clip AV stream
Clip
Clip
Clip

FIG.3

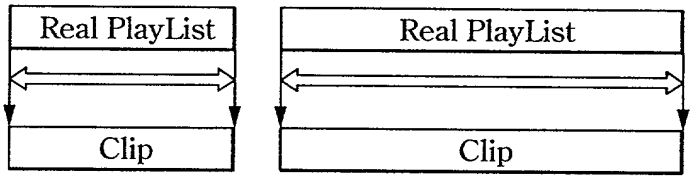


FIG.4A

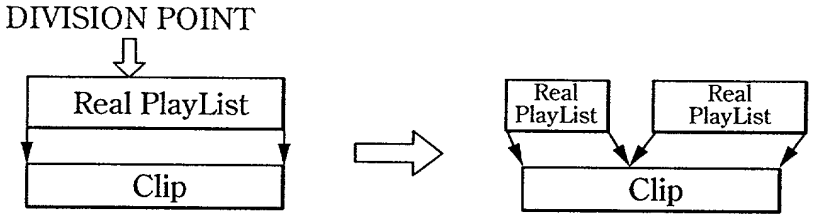


FIG.4B

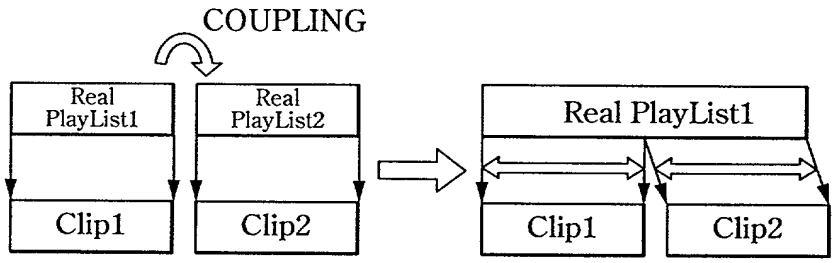


FIG.4C

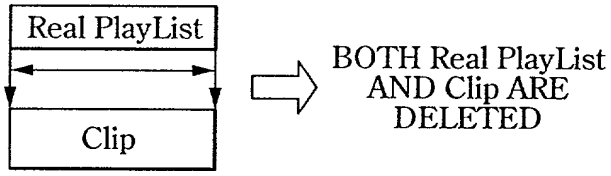


FIG.5A

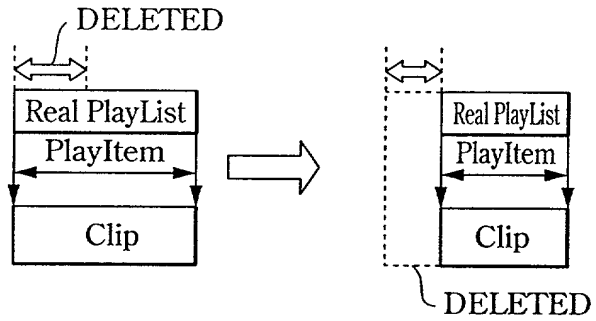


FIG.5B

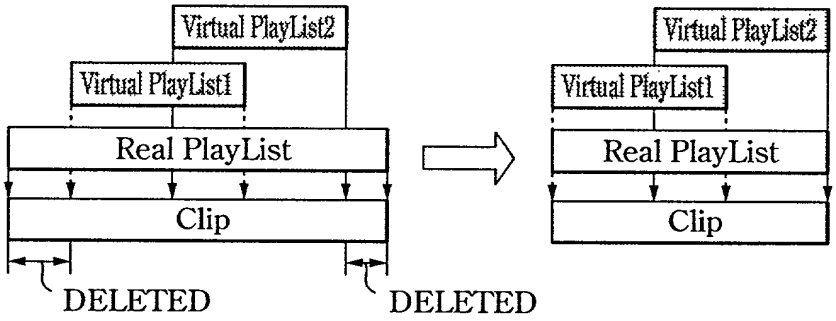


FIG.5C

EFS: 2005-05-25 15:36:04

FIG.6A

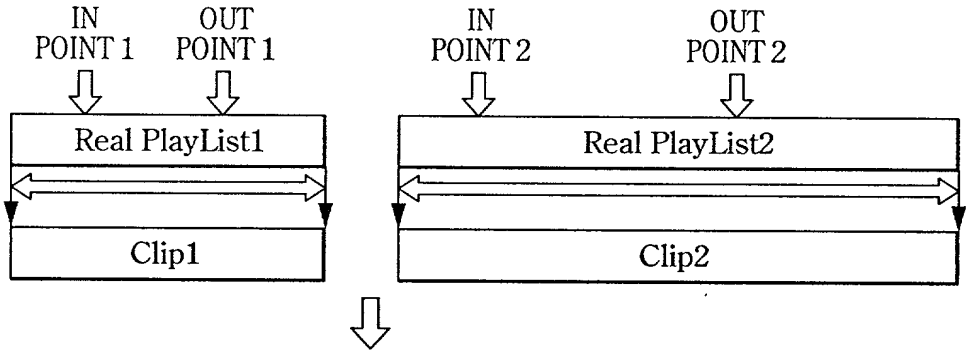
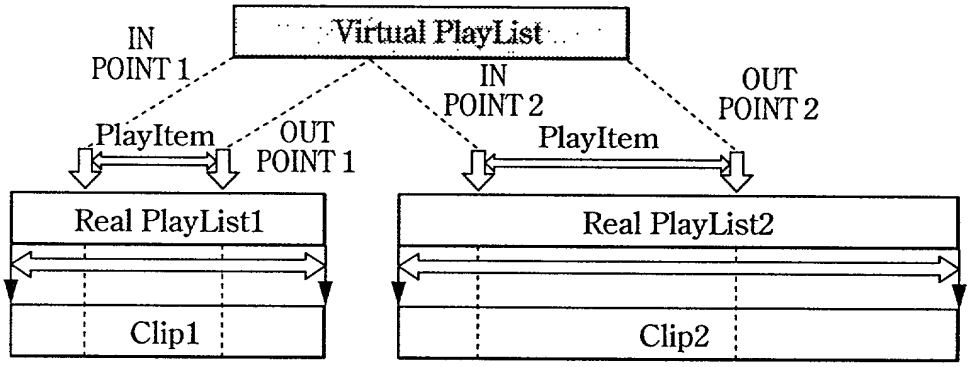

IN
POINT 1
OUT
POINT 1
IN
POINT 2
OUT
POINT 2
Real PlayList1
Real PlayList2
Clip1
Clip2

FIG.6B


Virtual PlayList
IN
POINT 1
OUT
POINT 1
IN
POINT 2
OUT
POINT 2
PlayItem
PlayItem
Real PlayList1
Real PlayList2
Clip1
Clip2

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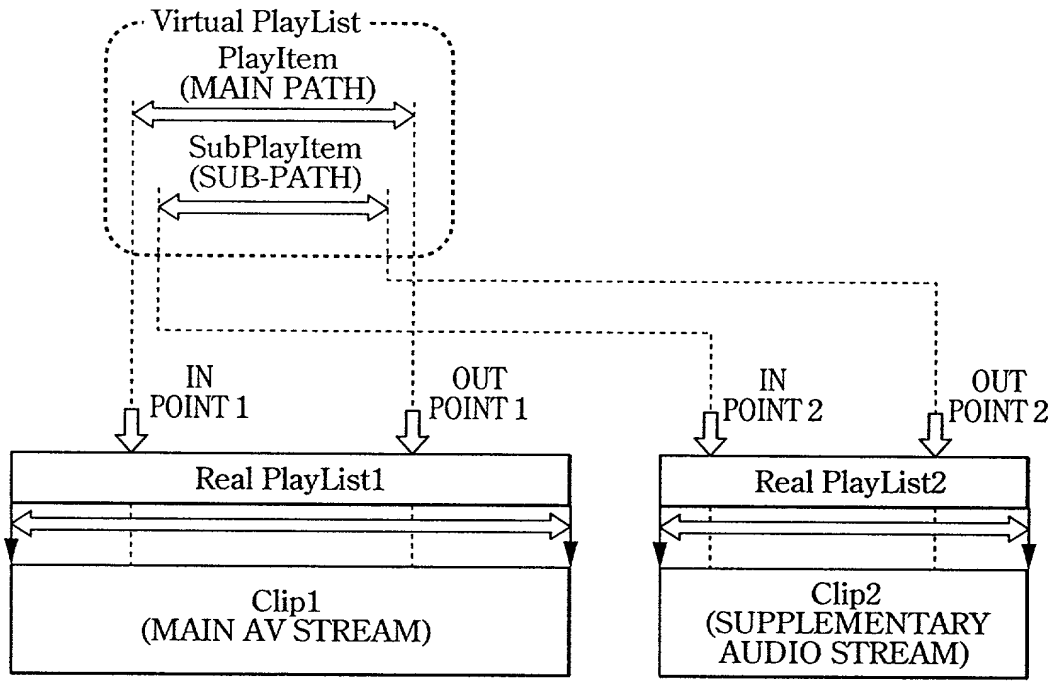

FIG.7

JP02001359039A

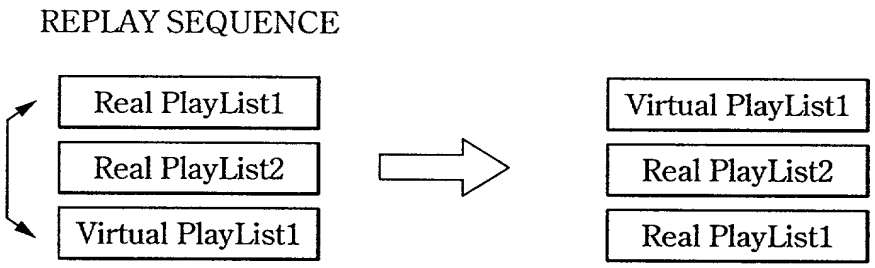

FIG.8

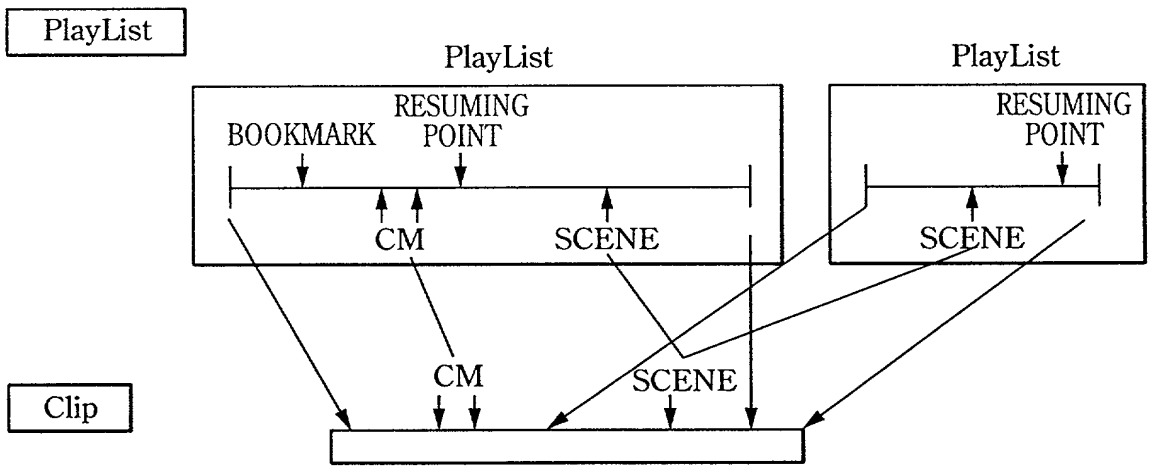
PlayList
PlayList
PlayList
RESUMING POINT
BOOKMARK
RESUMING POINT
CM
SCENE
SCENE
CM
SCENE
Clip

FIG.9

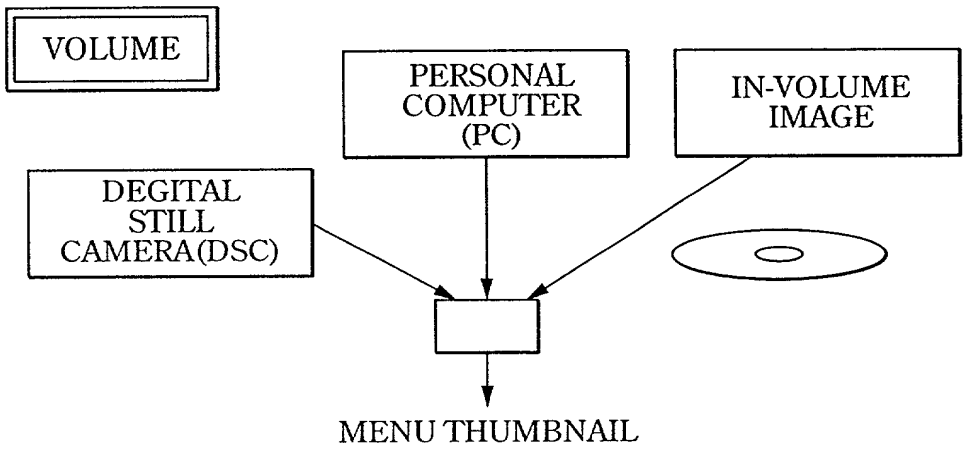
VOLUME
PERSONAL COMPUTER (PC)
IN-VOLUME IMAGE
DEGITAL STILL CAMERA(DSC)
MENU THUMBNAIL

FIG.10

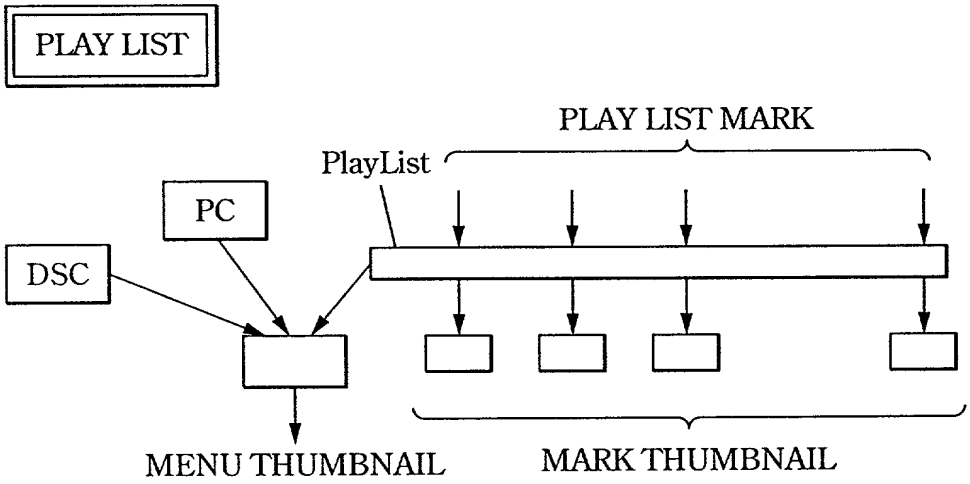
PLAY LIST
PLAY LIST MARK
PlayList
PC
DSC
MENU THUMBNAIL
MARK THUMBNAIL

FIG.11

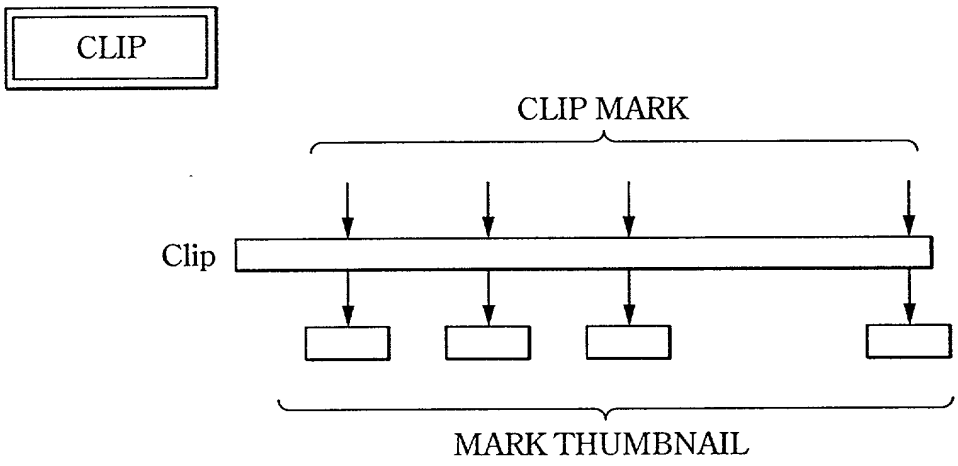
CLIP
CLIP MARK
Clip
MARK THUMBNAIL

FIG.12

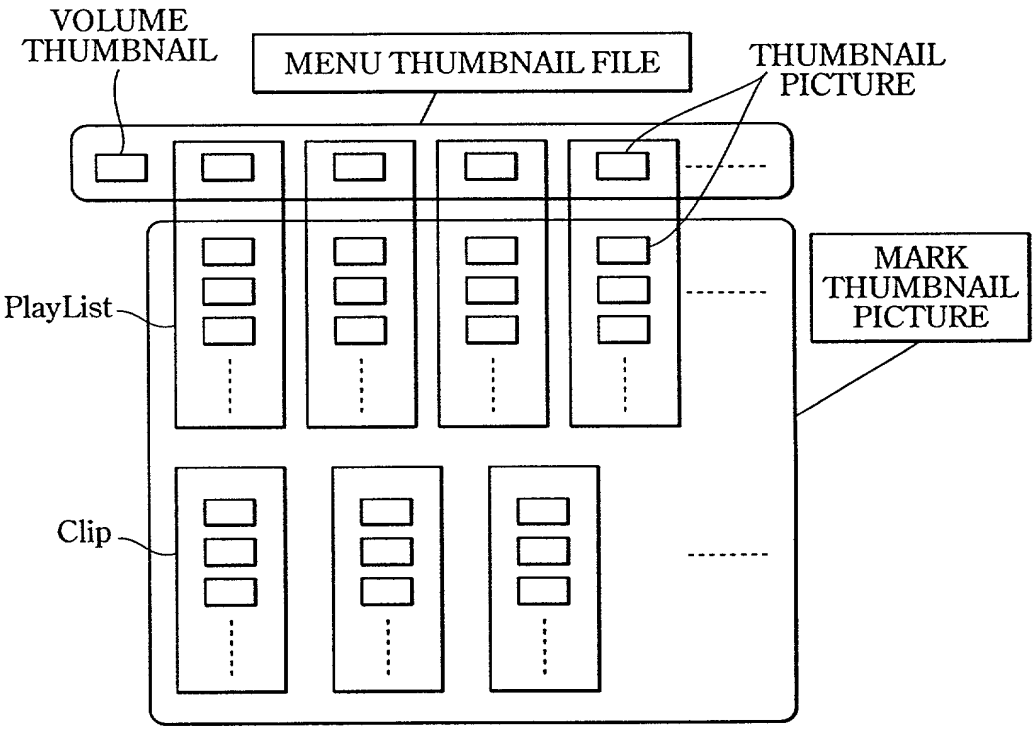
VOLUME THUMBNAIL
MENU THUMBNAIL FILE
THUMBNAIL PICTURE
MARK THUMBNAIL PICTURE
PlayList
Clip

FIG.13

EP 018837

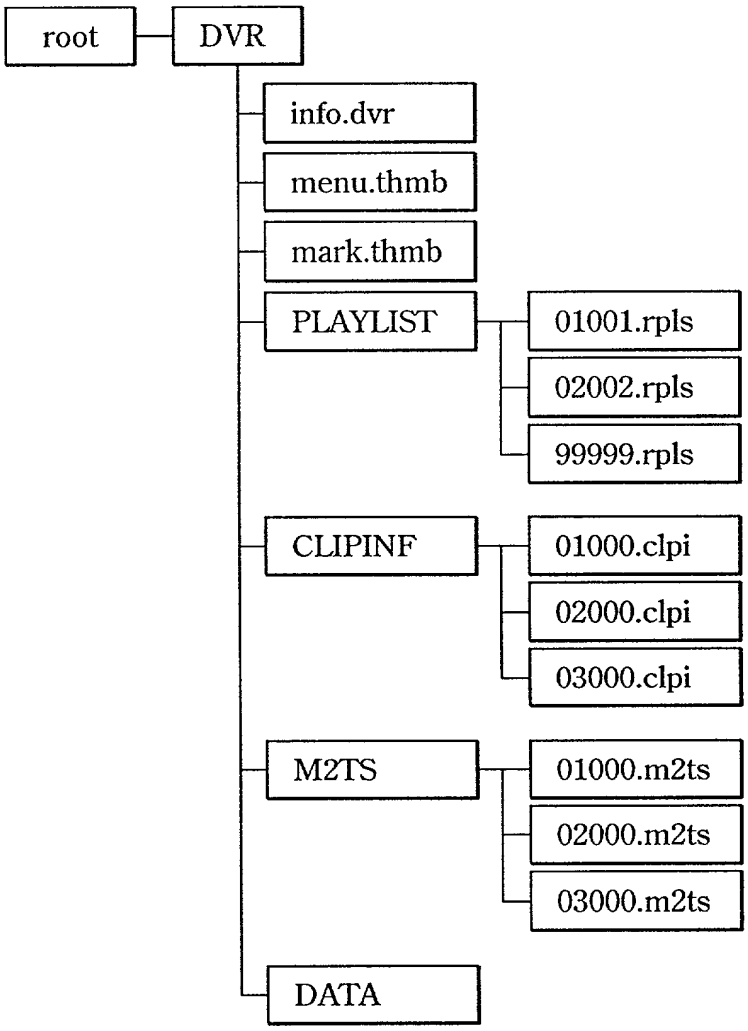

FIG.14

Printed by Jouve, 75001 PARIS (FR)

SYNTAX	NUMBER OF BYTES	ABBREVIATION
info.dvr {		
TableOfPlayLists_Start_address	32	uimsbf
MakersPrivateData_Start_address	32	uimsbf
reserved	192	bslbf
DVRVolume()		
for (i=0;i<N1;i++){		
padding_word	16	bslbf
}		
TableOfPlayLists()		
for (i=0;i<N2;i++){		
padding_word	16	bslbf
}		
MakersPrivateData()		
}		

FIG.15

Attorney Docket No. 0505.1360

SYNTAX	NUMBER OF BYTES	ABBREVIATION
DVRVolume(){		
version_number	8*4	bslbf
length	32	uimsbf
ResumeVolume()		
UIAppInfoVolume()		
}		

FIG.16

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SYNTAX	NUMBER OF BYTES	ABBREVIATION
ResumeVolume(){		
reserved	15	bslbf
valid_flag	1	bslbf
resume_PlayList_name	8*10	bslbf
}		

FIG.17

JP02/05974 • 05.02.2002

SYNTAX	NUMBER OF BYTES	ABBREVIATION
UIAppInfoVolume(){		
character_set	8	bslbf
name_length	8	uimsbf
Volume_name	8*256	bslbf
reserved	15	bslbf
Volume_protect_flag	1	bslbf
PIN	8*4	bslbf
ref_thumbnail_index	16	uimsbf
reserved	7	bslbf
rp_info_valid_flag	1	uimsbf
rp_ref_to_PlayList_file_name	8*10	bslbf
rp_ref_to_PlayItem_id	16	uimsbf
rp_time_stamp	32	uimsbf
}		

FIG.18

09/018837 PCT/JP00/04054

VALUE	CHARACTER LETTER ENCODING
0x00	Reserved
0x01	ISO/IEC 646 (ASCII)
0x02	ISO/IEC 10646-1 (Unicode)
0x03-0xff	Reserved

FIG.19

EP 0 954 855 B1

SYNTAX	NUMBER OF BYTES	ABBREVIATION
TableOfPlayLists(){		
version_number	8*4	bslbf
length	32	uimsbf
number_of_PlayLists	16	uimsbf
for (i=0; i<*number_of_PlayLists*; i++){		
PlayList_file_name	8*10	bslbf
}		
}		

FIG.20

JP02/08837 10.05.02

SYNTAX	NUMBER OF BYTES	ABBREVIATION
TableOfPlayLists(){		
version_number	8*4	bslbf
length	32	uimsbf
number_of_PlayLists	16	uimsbf
for (i=0; i<*number_of_PlayLists*; i++){		
PlayList_file_name	8*10	bslbf
UIAppInfoPlayList()		
}		
}		

FIG.21

SYNTAX	NUMBER OF BYTES	ABBREVIATION
MakersPrivateData(){		
version_number	8*4	bslbf
length	32	uimsbf
if (length !=0){		
mpd_blocks_start_address	32	uimsbf
number_of_maker_entries	16	uimsbf
mpd_block_size	16	uimsbf
number_of_mpd_blocks	16	uimsbf
reserved	16	bslbf
for (i=0; i<*number_of_maker_entries*; i++){		
maker_ID	16	uimsbf
maker_model_code	16	uimsbf
start_mpd_block_number	16	uimsbf
reserved	16	bslbf
mpd_length	32	uimsbf
}		
stuffing_bytes	8*2*L1	bslbf
for(j=0; j<*number_of_mpd_blocks*; j++){		
mpd_block	mpd_block_size*1024*8	
}		
}		
}		

FIG.22

translation of 2000-358

EP01250004.0 - 2202 / 1256 N

SYNTAX	NUMBER OF BYTES	ABBREVIATION
xxxxx.rpls / yyyyy.vpls {		
PlayListMark_Start_address	32	uimsbf
MakersPrivateData_Start_address	32	uimsbf
reserved	192	bslbf
PlayList()		
for (i=0;i<N1;i++){		
padding_word	16	bslbf
}		
PlayListMark()		
for (i=0;i<N2;i++){		
padding_word	16	bslbf
}		
MakersPrivateData()		
}		

FIG.23

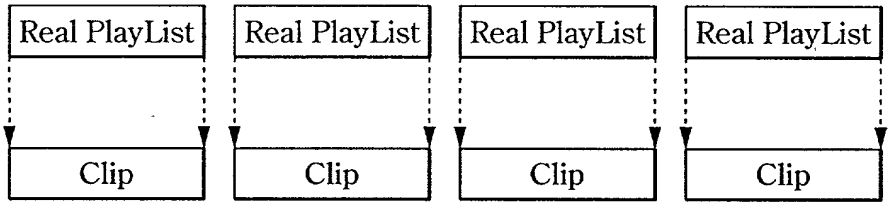

FIG.24A

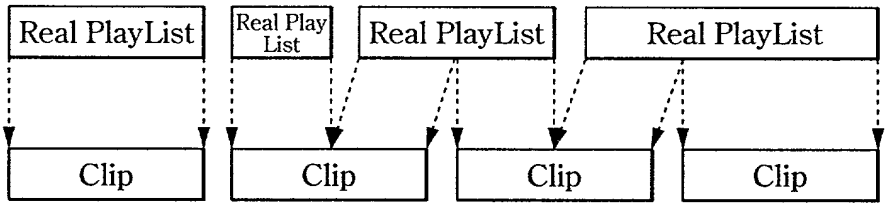

FIG.24B

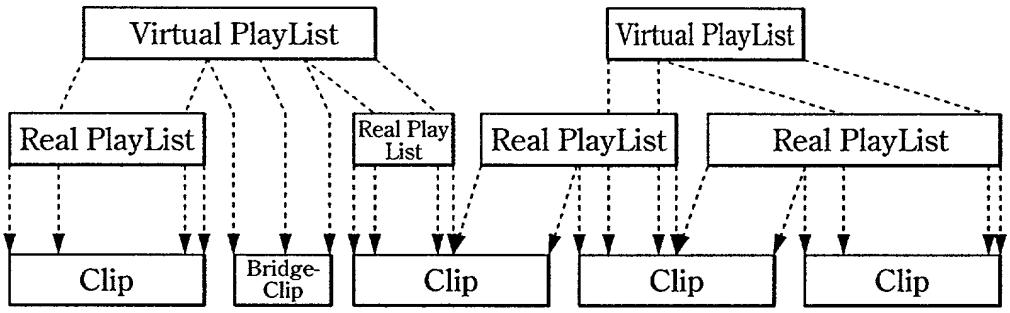

FIG.24C

SYNTAX	NUMBER OF BYTES	ABBREVIATION
PlayList(){		
version_number	8*4	bslbf
length	32	uimsbf
PlayList_type	8	uimsbf
CPI_type	1	bslbf
reserved	7	bslbf
UIAppInfoPlayList()		
number_of_PlayItems // main path	16	uimsbf
if (<*Vertual PlayList*>){		
number_of_SubPlayItems // sub path	16	uimsbf
}else{		
reserved	16	bslbf
}		

for (*PlayItem_id=0;*
PlayItem_id<nymber_of_PlayItems;
PlayItem_id++){		

PlayItem() //main path		
}		
if (<*Virtual PlayList*>){		
if (CPI_type==0 && PlayList_type==0){		
for (i=0; i<*number_of _SubPlayItems*; i++)		
SubPlayItem() //sub path		
}		
}		
}		

FIG.25

JP02/09604 09.12.02

PlayList_type	MEANING
0	PLAY LIST FOR AV RECORDING ALL CLIPS REFERENCED IN THIS PLAY LIST MUST CONTAIN ONE OR MORE VIDEO STREAMS
1	PLAY LIST FOR AUDIO RECORDING ALL CLIPS REFERENCED IN THIS PLAYLIST MUST CONTAIN ONE OR MORE AUDIO STREAMS AND MUST NOT CONTAIN VIDEO STREAMS
2-255	reserved

FIG.26

SYNTAX	NUMBER OF BYTES	ABBREVIATION
UIAppInfoPlayList2() {		
character_set	8	bslbf
name_length	8	uimsbf
PlayList_name	8*256	bslbf
reserved	8	bslbf
record_time_and_date	4*14	bslbf
reserved	8	bslbf
duration	4*6	bslbf
valid_period	4*8	bslbf
maker_id	16	uimsbf
maker_code	16	uimsbf
reserved	11	bslbf
playback_control_flag	1	bslbf
write_protect_flag	1	bslbf
is_played_flag	1	bslbf
archive	2	bslbf
ref_thumbnail_index	16	uimsbf
reserved_for_future_use	256	bslbf
}		

FIG.27

write_protect_flag	MEANING
0b	THE PlayList CAN BE ERASED FREELY
1b	THE PlayList CONTENTS SHOULD NOT BE ERASED NOR CHANGED EXCEPT write-protect-flag

FIG.28A

is_played_flag	MEANING
0b	THE PlayList HAS NOT BEEN REPRODUCED SINCE ITS RECORDING
1b	THE PlayList WAS ONCE REPRODUCED SINCE ITS RECORDING

FIG.28B

archive	MEANING
00b	NO MEANING DEFINED
01b	ORIGINAL
10b	COPY
11b	reserved

FIG.28C

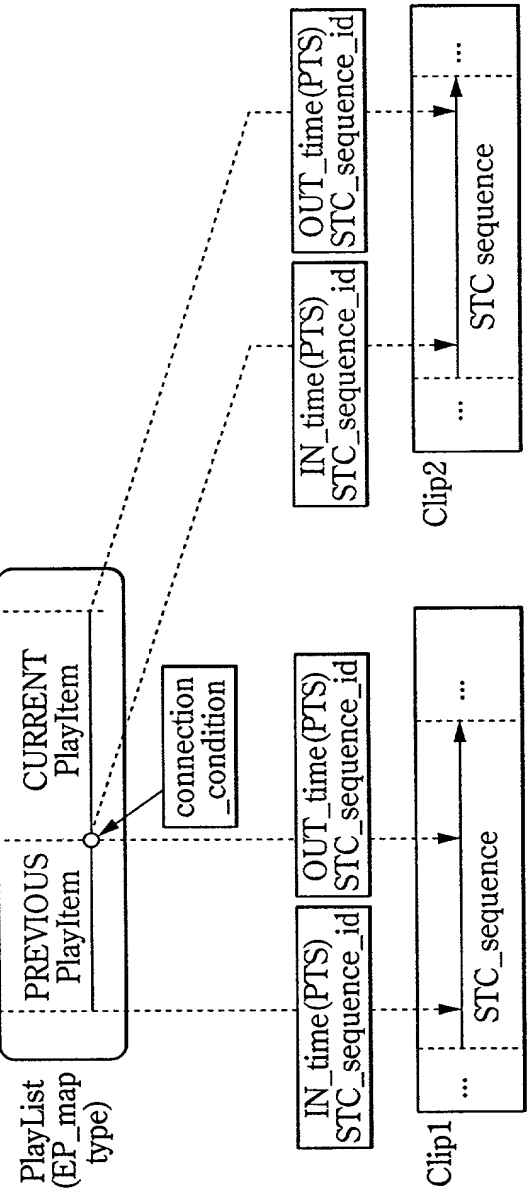
GLOBAL TIME AXIS OF PlayList
PlayList (EP_map type)
PREVIOUS PlayItem
CURRENT PlayItem
connection _condition
IN_time(PTS) STC_sequence_id
OUT_time(PTS) STC_sequence_id
IN_time(PTS) STC_sequence_id
OUT_time(PTS) STC_sequence_id
Clip1
Clip2
STC_sequence
STC sequence

FIG.29

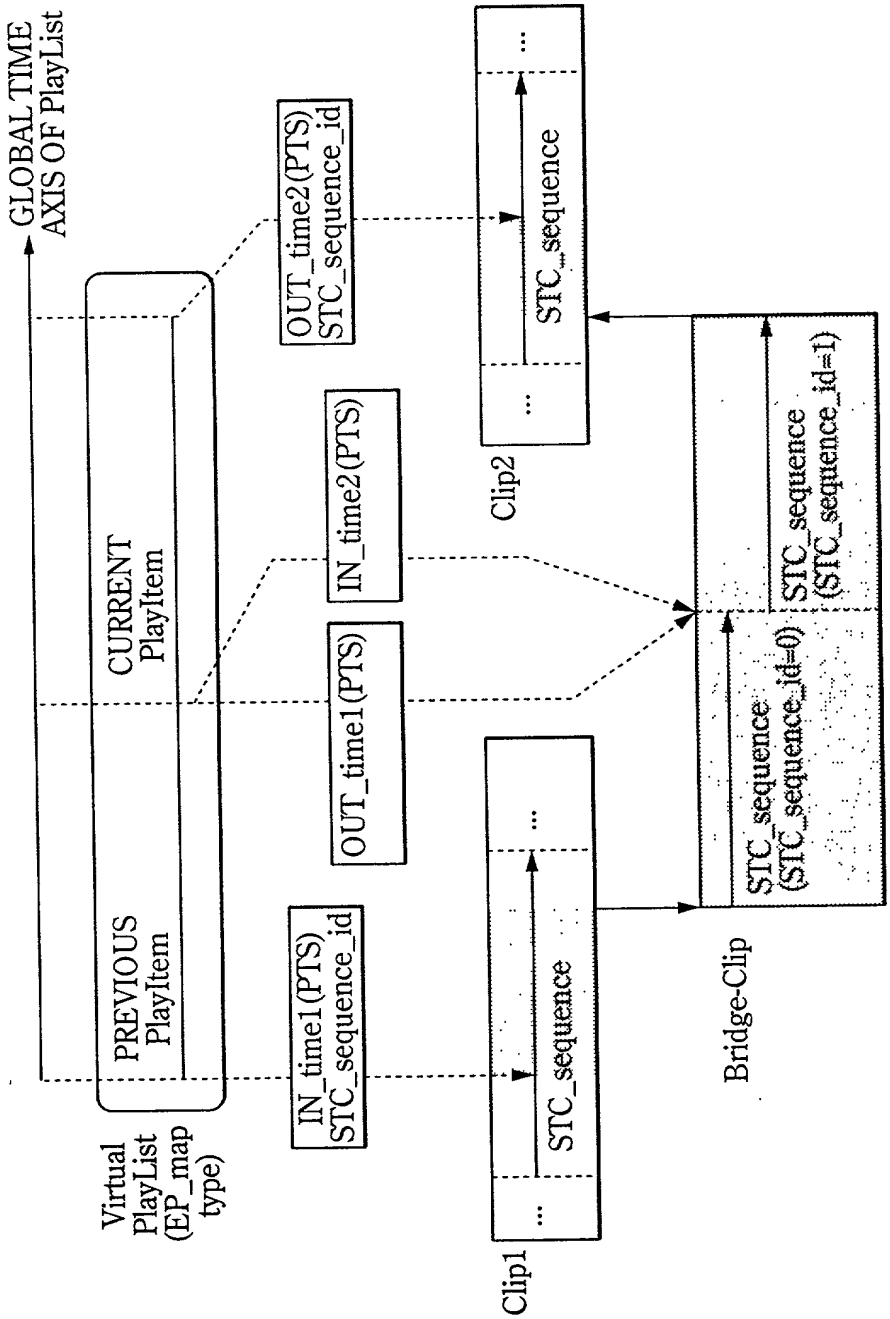
GLOBAL TIME
AXIS OF PlayList
Virtual
PlayList
(EP_map
type)
PREVIOUS
PlayItem
CURRENT
PlayItem
IN_time1(PTS)
STC_sequence_id
OUT_time1(PTS)
IN_time2(PTS)
OUT_time2(PTS)
STC_sequence_id
Clip1
STC_sequence
Clip2
STC_sequence
Bridge-Clip
STC_sequence
(STC_sequence_id=0)
STC_sequence
(STC_sequence_id=1)

FIG.30

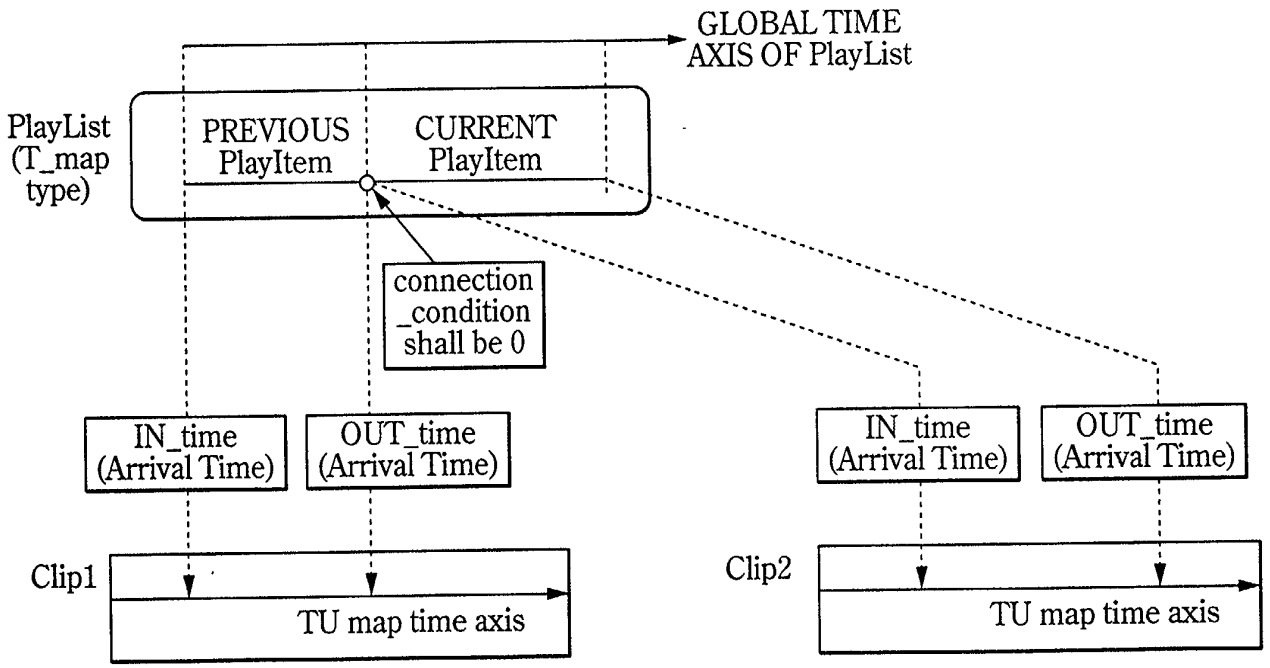
GLOBAL TIME
AXIS OF PlayList
PlayList
(T_map
type)
PREVIOUS
PlayItem
CURRENT
PlayItem
connection
_condition
shall be 0
IN_time
(Arrival Time)
OUT_time
(Arrival Time)
IN_time
(Arrival Time)
OUT_time
(Arrival Time)
Clip1
TU map time axis
Clip2
TU map time axis

FIG.31

SYNTAX	NUMBER OF BYTES	ABBREVIATION
PlayItem(){		
Clip_information_file_name	8*10	bslbf
reserved	24	bslbf
STC_sequence_id	8	uimsbf
IN_time	32	uimsbf
OUT_time	32	uimsbf
reserved	14	bslbf
connection_condition	2	bslbf
if (<Virtual PlayList>){		
if (*connection_condition*=='*10*'){		
BridgeSequenceInfo()		
}		
}		
}		

FIG.32

Substitute Sheet (Rule 26)

JP02/09504

CPI_type in the PlayList()	SEMANTICS OF IN_time
EP_map type	IN_time MUST INDICATE UPPER 32 BITS OF 33 BIT LENGTH CORRESPONDING TO FIRST PRESENTATION UNIT IN PlayItem
TU_map type	IN_time MUST BE TIME ON TU_map_time_axis, AND MUST BE ROUNDED TO time_unit PRECISION. IN-time IS CALCULATED BY FOLLOWING EQUATION: $IN_time = TU_start_time \%2^{32}$

FIG.33

CPI_type in the PlayList()	SEMANTICS OF OUT_time
EP_map type	OUT_time MUST INDICATE UPPER 32 BITS OF THE VALUE OF Presentation_end_TS CALCULATED BY FOLLOWING EQUTION: Presentation_end_TS = PTS_out+AU_duration WHERE PTS_out IS 33-BIT LONG PTS CORRESPONDING TO LAST PRESENTATION UNIT IN PlayItem. AU_duration IS 90 kHz-DISPLAY TIME OF LAST PRESENTATION UNIT.
TU_map type	OUT_time MUST BE TIME ON TU_map_time_axis AND BE ROUNDED TO time_unit PRECISION. OUT_time IS CALCULATED BY FOLLOWING EQUATION: $OUT_time = TU_start_time \ \%2^{32}$

FIG.34

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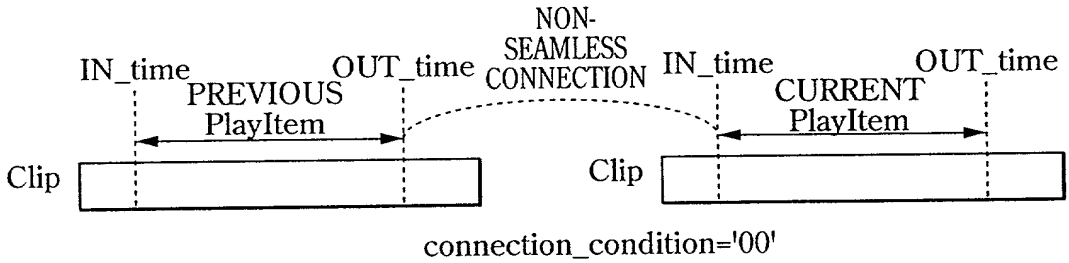
connection _condition	MEANING
00	· CONNECTION OF PREVIOUS PlayItem TO CURRENT PlayItem IS NOT SURE AS TO SEAMLESS REPLAY. · IF CPI_type OF PlayList IS TU_map type, THIS VALUE MUST BE SET IN connection_condition.
01	· THIS STATE IS ALLOWED ONLY WHEN CPI_type OF PlayList IS EP_map type. · PREVIOUS PlayItem AND CURRENT PlayItem INDICATE DIVISION BECAUSE OF NON-CONTINUOUS POINT OF SYSTEM TIMEBASE (STC BASE).
10	· THIS STATE IS ALLOWED ONLY WHEN CPI_type OF PlayList IS EP_map type. · THIS STATE IS ALLOWED ONLY FOR Virtual PlayList. · CONNECTION OF PREVIOUS PlayItem TO CURRENT PlayItem IS SURE AS TO SEAMLESS REPLAY. · PREVIOUS PlayItem IS CONNECTED TO CURRENT PlayItem USING BridgeSequence. DVR MPEG-2 TRANSPORT STREAM MUST OBEY DVR-STD AS LATER DESCRIBED.
11	· THIS STATE IS ALLOWED ONLY WHEN CPI_type OF PlayList IS EP_map type. · CONNECTION OF PREVIOUS PlayItem TO CURRENT Play Item IS SURE AS TO SEAMLESS REPLAY. · PREVIOUS PlayItem IS CONNECTED TO CURRENT PlayItem WITHOUT USING BridgeSequence. DVR MPEG-2 TRANSPORT STREAM MUST OBEY DVR-STD AS LATER DESCRIBED.

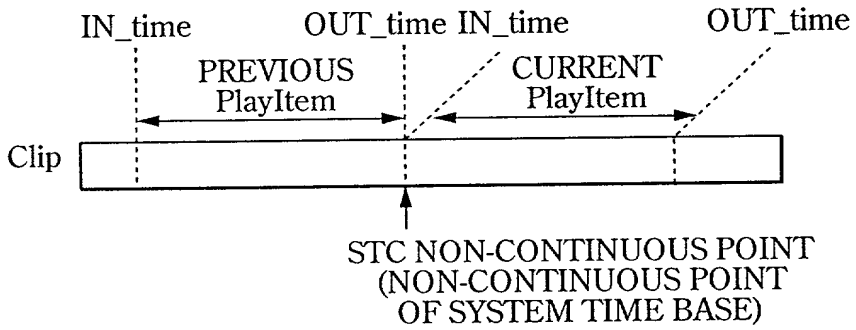
FIG.35

EP0863507A2 | 1998-09-09



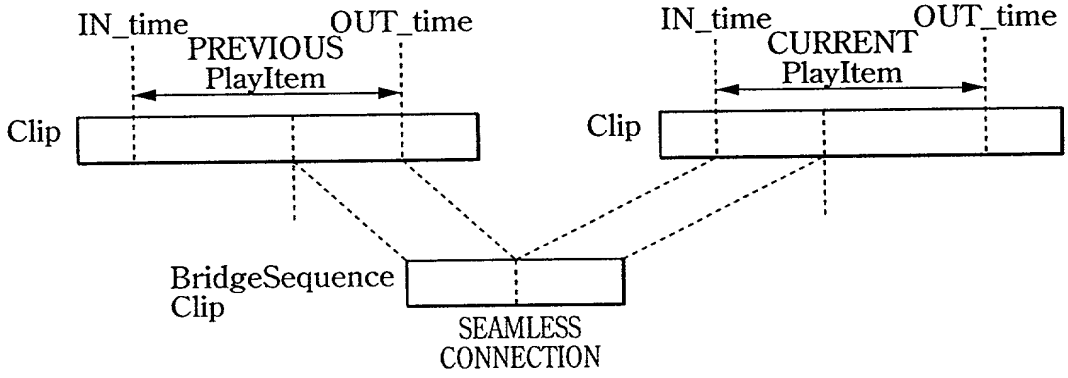
connection_condition='00'

FIG.36A



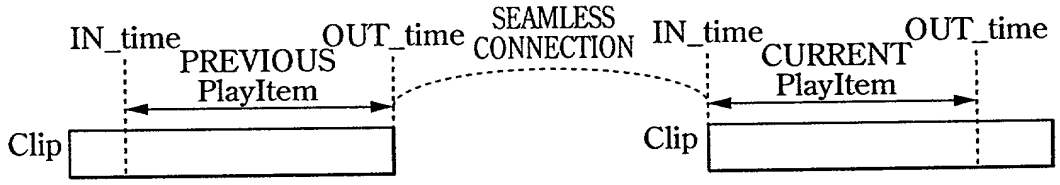
connection_condition='01'

FIG.36B



connection_condition='10'

FIG.36C



connection_condition='11'

FIG.36D

JP01/08837 WO 02/15583 PCT/JP01/08837

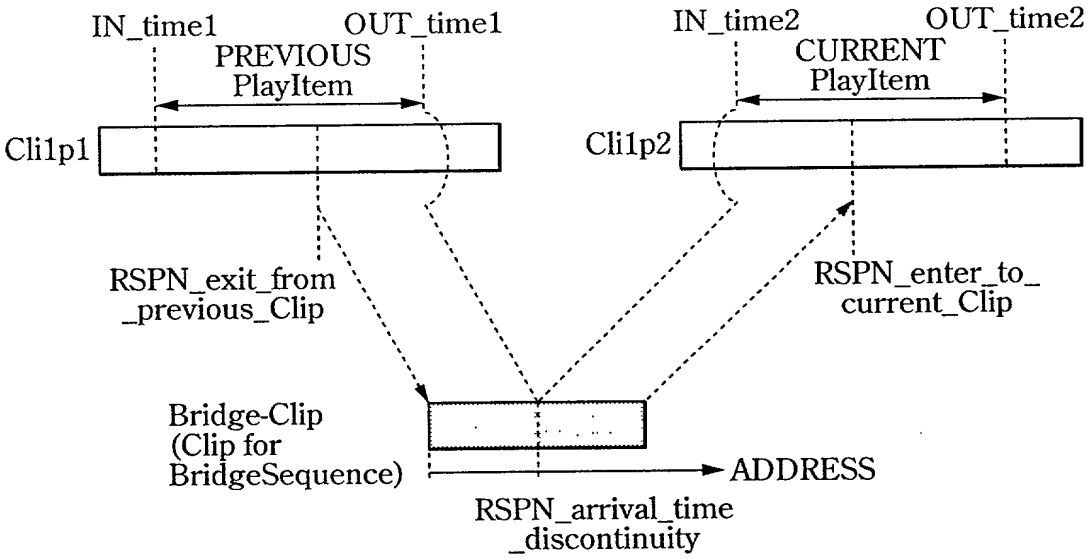


FIG.37

SYNTAX	NUMBER OF BYTES	ABBREVIATION
BridgeSequenceInfo() {		
Bridge_Clip_information_file_name	8*10	bslbf
RSPN_exit_from_previous_Clip	32	uimsbf
RSPN_enter_to_current_Clip	32	uimsbf
}		

FIG.38

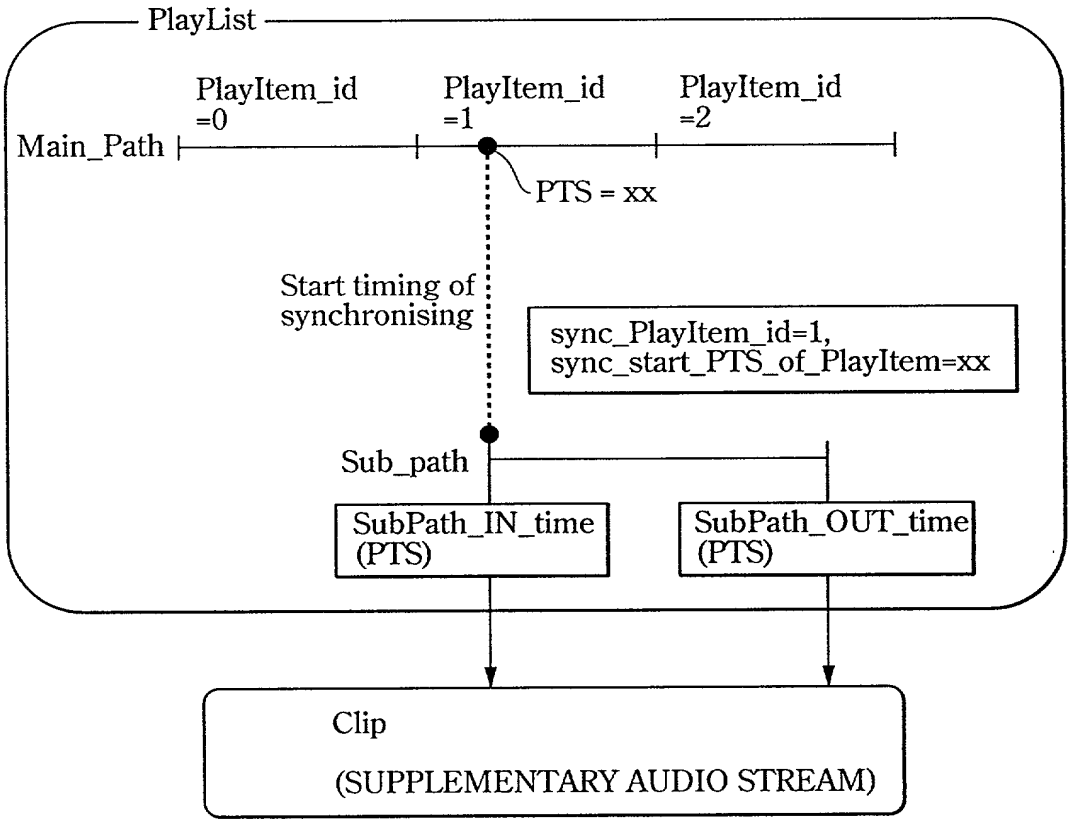

PlayList
PlayItem_id =0
PlayItem_id =1
PlayItem_id =2
Main_Path
PTS = xx
Start timing of synchronising
sync_PlayItem_id=1, sync_start_PTS_of_PlayItem=xx
Sub_path
SubPath_IN_time (PTS)
SubPath_OUT_time (PTS)
Clip
(SUPPLEMENTARY AUDIO STREAM)

FIG.39

EP01985704.0-2215 / 1360794

SYNTAX	NUMBER OF BYTES	ABBREVIATION
SubPlayItem(){		
Clip_Information_file_name	8*10	bslbf
SubPath_type	8	bslbf
sync_PlayItem_id	8	uimsbf
sync_start_PTS_of_PlayItem	32	uimsbf
SubPath_IN_time	32	uimsbf
SubPath_OUT_time	32	uimsbf
}		

FIG.40

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SubPath_type	MEANING
0x00	Auxiliary audio steam path
0x01-0xff	reserved

FIG.41

EP 1 018 837 A2

SYNTAX	NUMBER OF BYTES	ABBREVIATION
PlayListMark(){		
version_number	8*4	bslbf
length	32	uimsbf
number_of_PlayList_marks	16	uimsbf
for (i=0;i<*number_of_PlayList_marks*;i++){		
reserved	8	bslbf
mark_type	8	bslbf
mark_time_stamp	32	uimsbf
PlayItem_id	8	uimsbf
reserved	24	uimsbf
character_set	8	bslbf
name_length	8	uimsbf
mark_name	8*256	bslbf
ref_thumbnail_index	16	uimsbf
}		
}		

FIG.42

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Mark_type	MEANING	COMMENT
0x00	resume-mark	REPLAY RESUME POINT. THE NUMBER OF REPLAY RESURE POINTS DEFINED IN PlayListMark() MUST BE 0 OR 1.
0x01	book-mark	REPLAY ENTRY POINT OF PlayList. THIS MARK CAN BE SET BY USER AND USED AS MARK SPECIFYING START POINT OF FAVORITE SCENE.
0x02	skip-mark	SKIP MARK POINT. PLAYER SKIPS PROGRAM FROM THIS POINT TO THE END OF PROGRAM. THE NUMBER OF SKIP MARK POINTS DEFINED IN PlayListMark() MUST BE 0 RO 1.
0x03-0x8F	reserved	
0x90-0xFF	reserved	Reserved for ClipMark()

FIG.43

CPI_type in the PlayList()	SEMANTICS OF mark_time_stamp
EP_map type	mark_time_stamp MUST INDICATE UPPER 32 BITS OF 33 BIT LENGTH PTS CORRESPONDING TO PRESENTATION UNIT REFERENCED BY MARK.
TU_map type	mark_time_stamp MUST BE TIME ON TU_map_time_axis AND MUST BE ROUNDED TO time_unit PRECISION. mark_time_stamp IS CALCULATED BY FOLLOWING EQUATION: $$mark_time_stamp = TU_start_time \%2^{32}$$

FIG.44

SYNTAX	NUMBER OF BYTES	ABBREVIATION
zzzzz.clpi {		
STC_Info_Start_address	32	uimsbf
ProgramInfo_Start_address	32	uimsbf
CPI_Start_address	32	uimsbf
ClipMark_Start_address	32	uimsbf
MakersPrivateData_Start_address	32	uimsbf
reserved	96	bslbf
ClipInfo()		
for (i=0;i<N1;i++){		
padding_word	16	bslbf
}		
STC_Info()		
for (i=0;i<N2;i++){		
padding_word	16	bslbf
}		
ProgramInfo()		
for (i=0;i<N3;i++){		
padding_word	16	bslbf
}		
CPI()		
for (i=0;i<N4;i++){		
padding_word	16	bslbf
}		
ClipMark()		
for (i=0;i<N5;i++){		
padding_word	16	bslbf
}		
MakersPrivateData()		
}		

FIG.45

SYNTAX	NUMBER OF BYTES	ABBREVIATION
ClipInfo(){		
version_number	8*4	bslbf
length	32	uimsbf
Clip_stream_type	8	bslbf
offset_SPN	32	uimsbf
TS_recording_rate	24	uimsbf
reserved	8	bslbf
record_time_and_date	4*14	bslbf
reserved	8	bslbf
duration	4*6	bslbf
reserved	7	bslbf
time_controlled_flag	1	bslbf
TS_average_rate	24	uimsbf
if (Clip_stream_type==1) // Bridge-Clip AV stream		
RSPN_arrival_time_discontinuity	32	uimsbf
else		
reserved	32	bslbf
reserved_for_system_use	144	bslbf
reserved	11	bslbf
is_format_identifier_valid	1	bslbf
is_original_network_ID_valid	1	bslbf
is_transport_stream_ID_valid	1	bslbf
is_service_ID_valid	1	bslbf
is_country_code_valid	1	bslbf
format_identifier	32	bslbf
original_network_ID	16	uimsbf
transport_stream_ID	16	uimsbf
service_ID	16	uimsbf
country_code	24	bslbf
stream_format_name	16*8	bslbf
reserved_for_fortune_use	256	bslbf
}		

FIG.46

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Clip_stream_type	MEANING
0	Clip AV STREAM
1	Bridge-Clip AV STREAM
2-255	Reserved

FIG.47

JP02/03754 - 05-12-2002

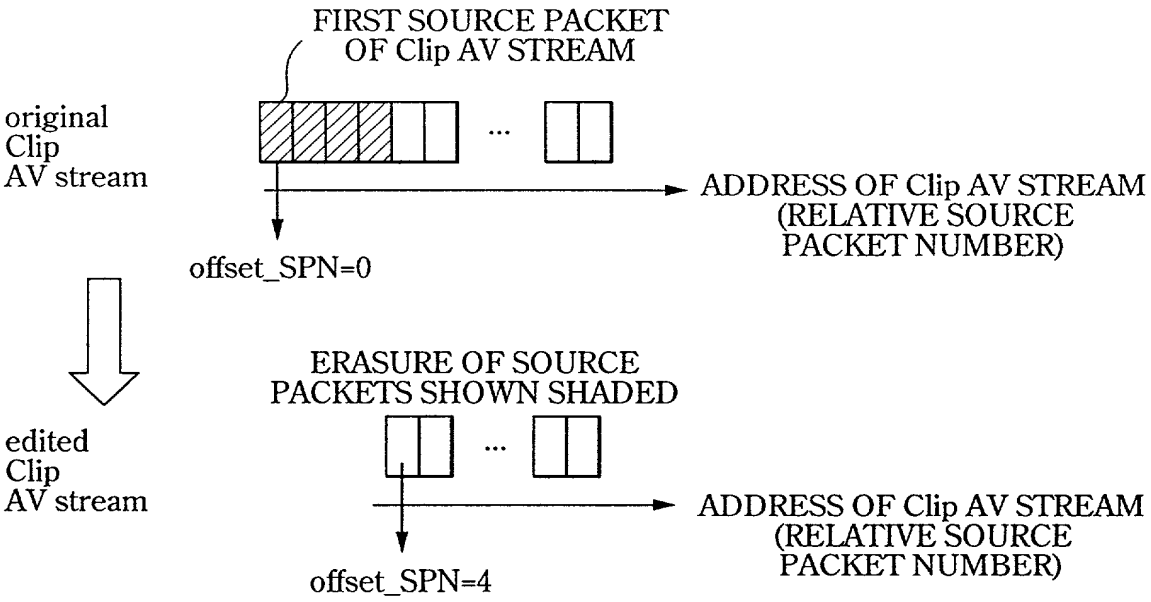

FIG.48

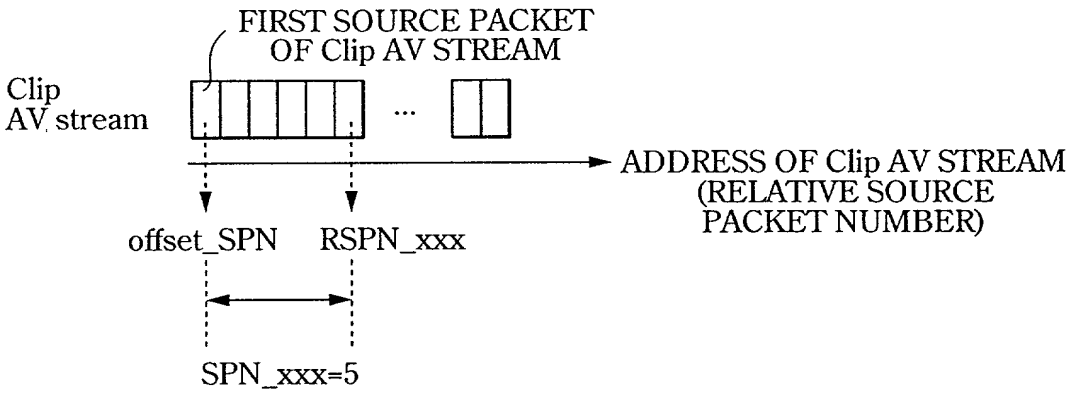

FIG.49

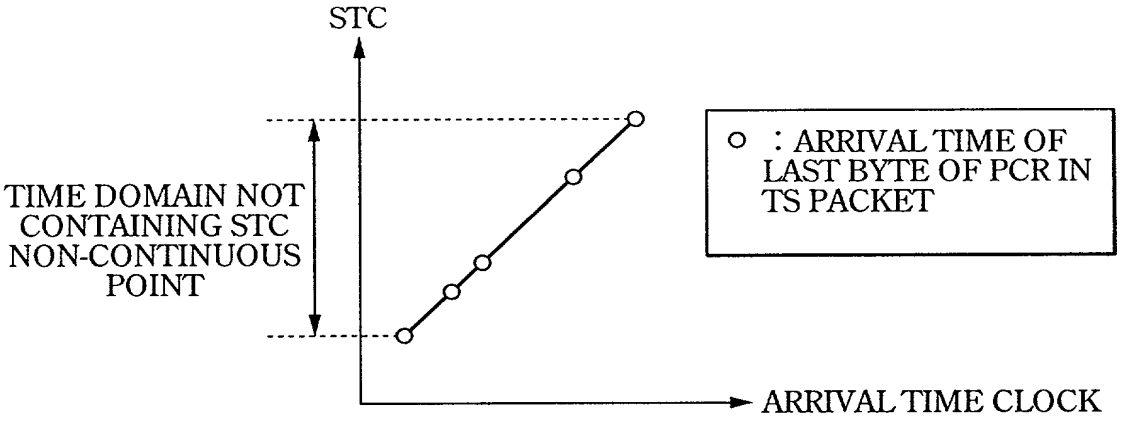

FIG.50A

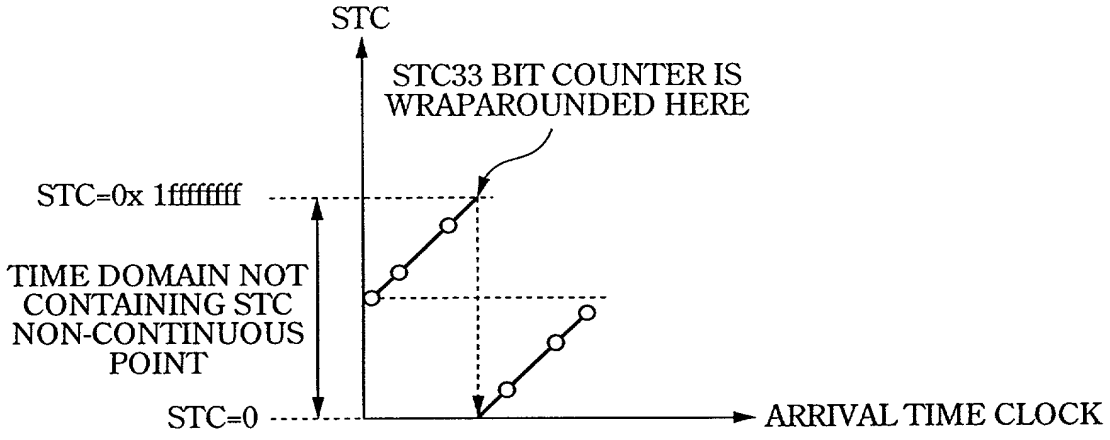

FIG.50B

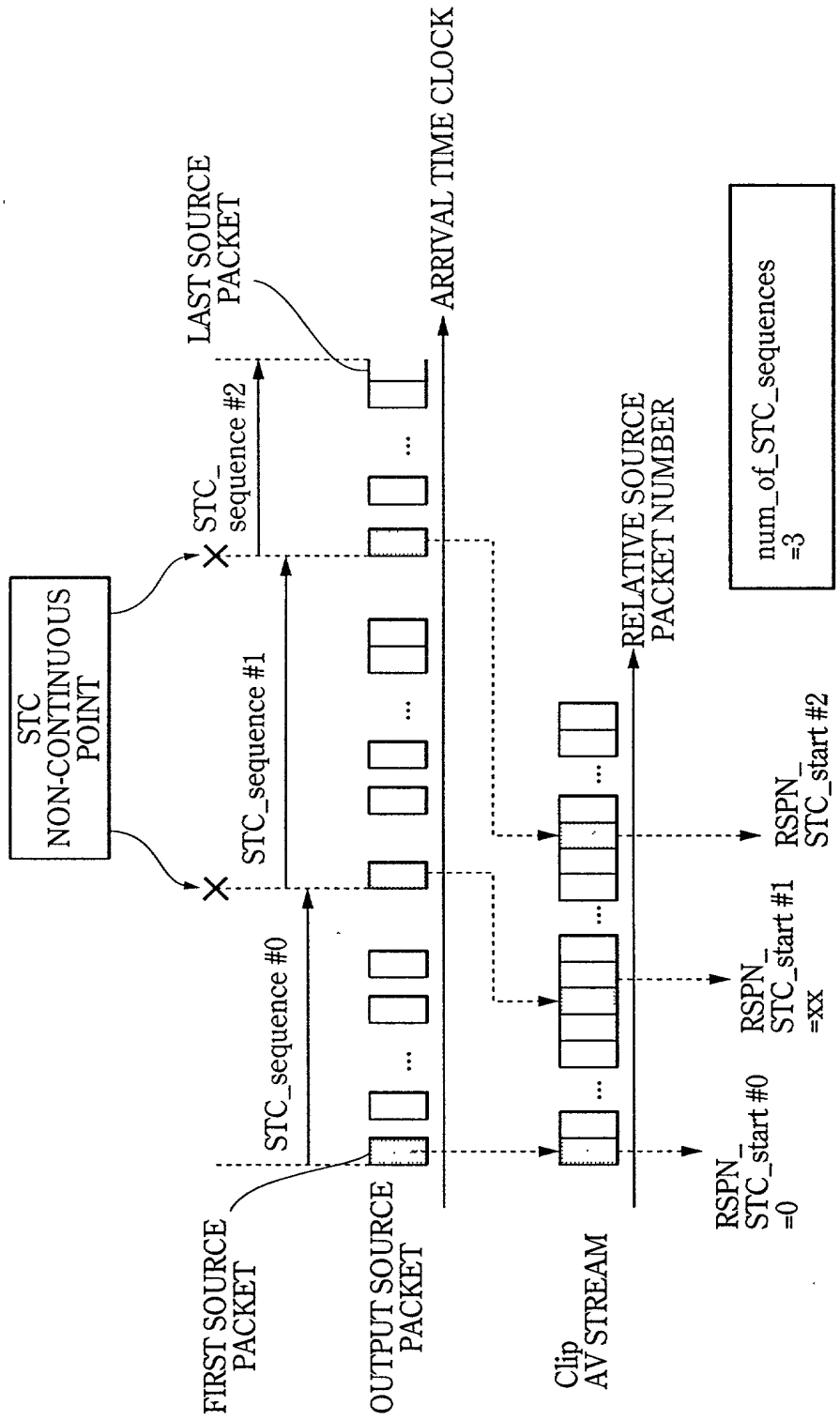
STC
NON-CONTINUOUS
POINT
STC_
sequence #2
LAST SOURCE
PACKET
ARRIVAL TIME CLOCK
STC_sequence #1
STC_sequence #0
RELATIVE SOURCE
PACKET NUMBER
num_of_STC_sequences
=3
RSPN_
STC_start #2
=yy
RSPN_
STC_start #1
=xx
RSPN_
STC_start #0
=0
FIRST SOURCE
PACKET
OUTPUT SOURCE
PACKET
Clip
AV STREAM

FIG.51

SYNTAX	NUMBER OF BYTES	ABBREVIATION
STC_Info(){		
version_number	8*4	bslbf
length	32	uimsbf
if (length !=0){		
reserved	8	bslbf
num_of_STC_sequences	8	uimsbf
for (*STC_sequence_id=0;* *STC_sequence_id<num_of_STC_sequences;* *STC_sequence_id++*){		
resereved	32	bslbf
RSPN_STC_start	32	uimsbf
}		
}		
}		

FIG.52

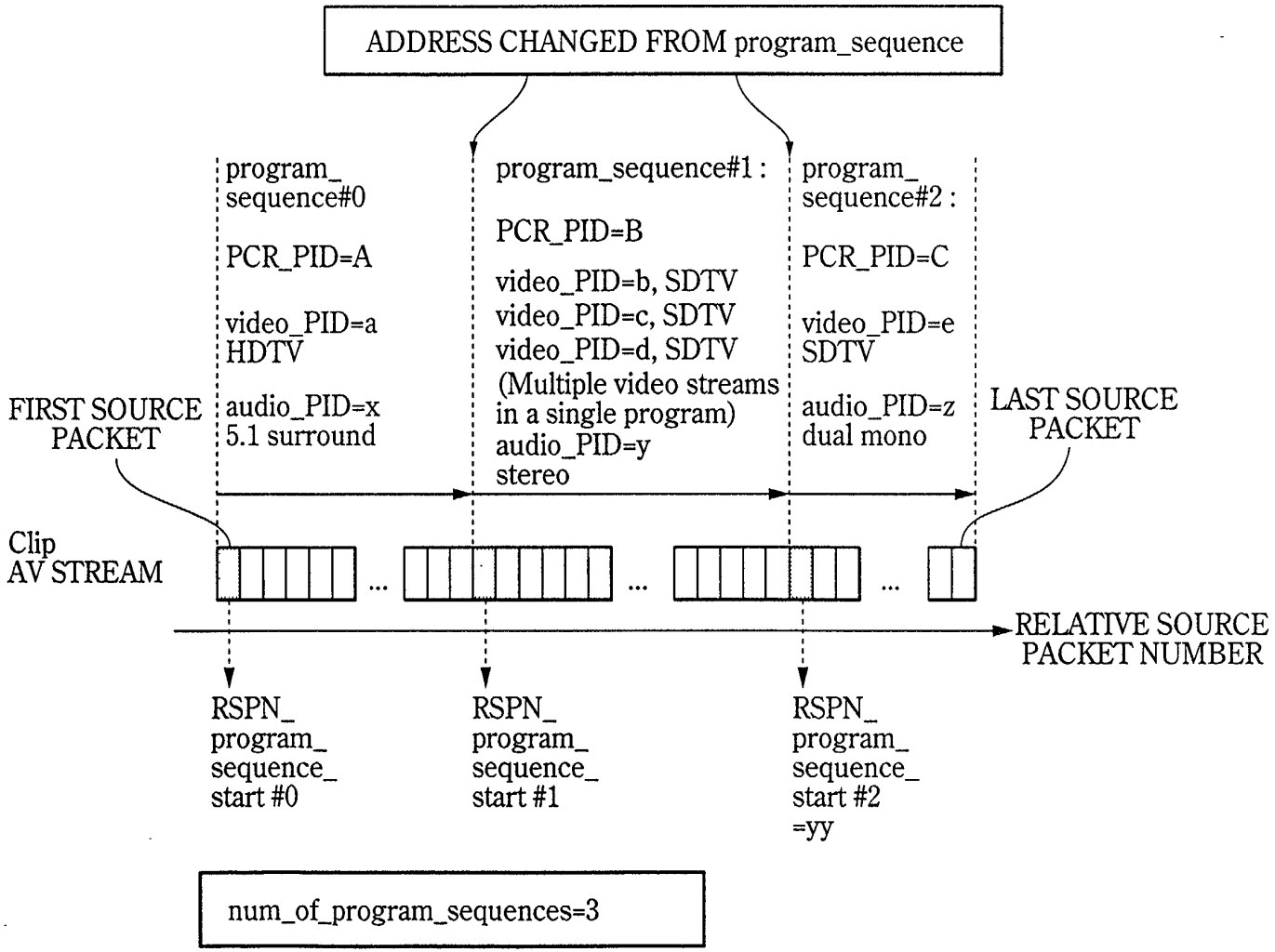
ADDRESS CHANGED FROM program_sequence
program_ sequence#0
PCR_PID=A
video_PID=a HDTV
audio_PID=x 5.1 surround
program_sequence#1 :
PCR_PID=B
video_PID=b, SDTV
video_PID=c, SDTV
video_PID=d, SDTV
(Multiple video streams in a single program)
audio_PID=y stereo
program_ sequence#2 :
PCR_PID=C
video_PID=e SDTV
audio_PID=z dual mono
FIRST SOURCE PACKET
LAST SOURCE PACKET
Clip AV STREAM
RELATIVE SOURCE PACKET NUMBER
RSPN_ program_ sequence_ start #0
RSPN_ program_ sequence_ start #1
RSPN_ program_ sequence_ start #2 =yy
num_of_program_sequences=3

FIG.53

SYNTAX	NUMBER OF BYTES	ABBREVIATION
ProgramInfo(){		
version_number	8*4	bslbf
length	32	uimsbf
if (length !=0){		
reserved	8	bslbf
number_of_program_sequences	8	uimsbf
for (i=0;i<*number_of_program_sequences*;i++){		
RSPN_program_sequence_start	32	uimsbf
reserved	48	bslbf
PCR_PID	16	bslbf
number_of_videos	8	uimsbf
number_of_audios	8	uimsbf
for (k=0;k<*number_of_videos*;k++){		
video_stream_PID	16	bslbf
VideoCodingInfo()		
}		
for (k=0;k<*number_of_audios*;k++){		
audio_stream_PID	16	bslbf
AudioCodingInfo()		
}		
}		
}		
}		

FIG.54

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SYNTAX	NUMBER OF BYTES	ABBREVIATION
VideoCodingInfo() {		
video_format	8	uimsbf
frame_rate	8	uimsbf
display_aspect_ratio	8	uimsbf
reserved	8	bslbf
}		

FIG.55

10/019837

video_format	MEANING
0	480i
1	576i
2	480p (including 640×480p format)
3	1080i
4	720p
5	1080p
6-254	reserved
255	No information

FIG.56

frame_rate	MEANING
0	forbidden
1	24 000/1001 (23.976...)
2	24
3	25
4	30 000/1001 (29.97..)
5	30
6	50
7	60 000/1001 (59.94..)
8	60
9-254	reserved
255	No information

FIG.57

translation of PCT/JP2005/014566

Replacement Sheet

display_aspect_ratio	MEANING
0	forbidden
1	reserved
2	4:3 display aspect ratio
3	16:9 display aspect ration
4-254	reserved
255	No information

FIG.58

EP01303047.0 - 2202

SYNTAX	NUMBER OF BYTES	ABBREVIATION
AudioCodingInfo() {		
audio_format	8	uimsbf
audio_component_type	8	uimsbf
sampling_frequency	8	uimsbf
reserved	8	bslbf
}		

FIG.59

10/019837

audio_coding	MEANING
0	MPEG-1 audio layer I or II
1	Dolby AC-3 audio
2	MPEG-2 AAC
3	MPEG-2 multi-channel audio, backward compatible to MPEG-1
4	SESF LPCM audio
5-254	reserved
255	No information

FIG.60

WO 2004/057863 PCT/JP2003/016537

audio_component_type	MEANING
0	single mono channel
1	dual mono channel
2	stereo (2-channel)
3	multi-lingual, multi-channel
4	surround sound
5	audio description for the visually impaired
6	audio for the hard of hearing
7-254	reserved
255	No information

FIG.61

sampling_frequency	MEANING
0	48 kHz
1	44.1 kHz
2	32 kHz
3-254	reserved
255	No information

FIG.62

EP01983762.5 - 2025 - 0512

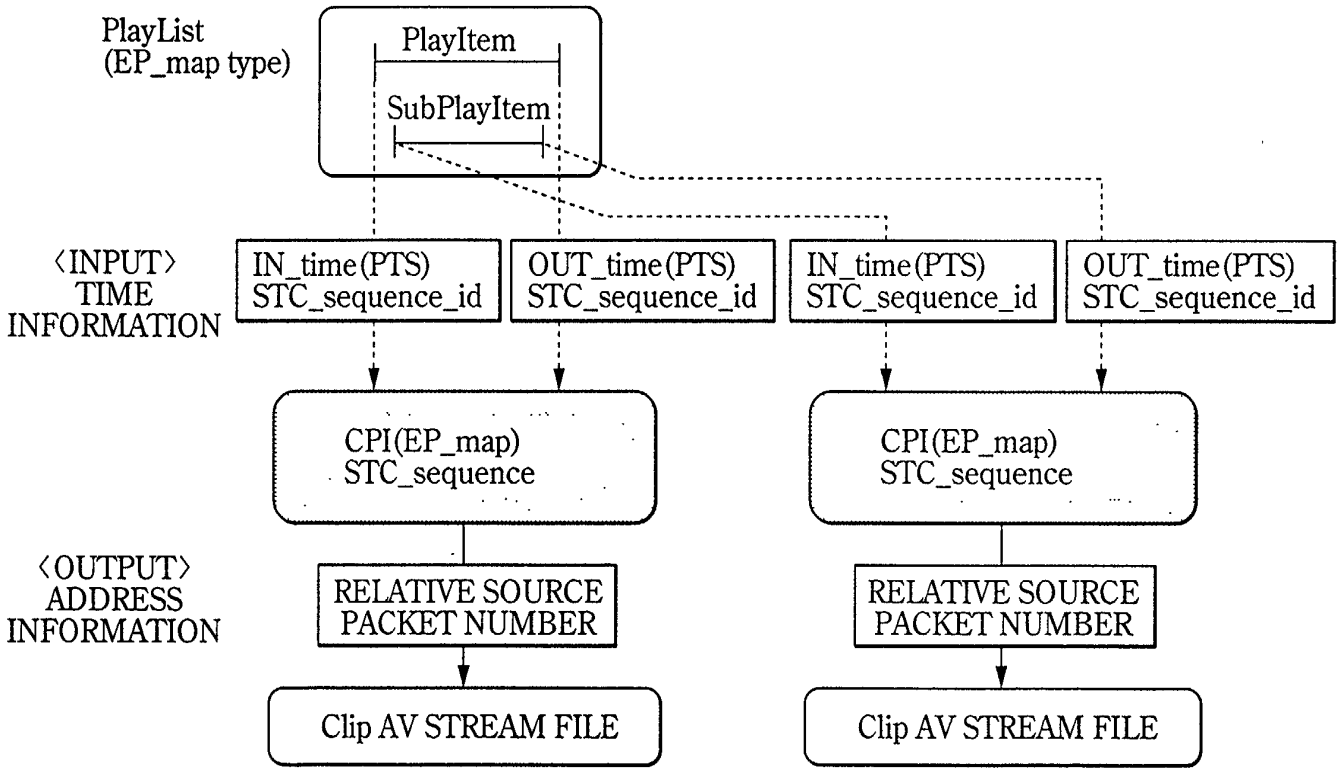

FIG.63

10/018837

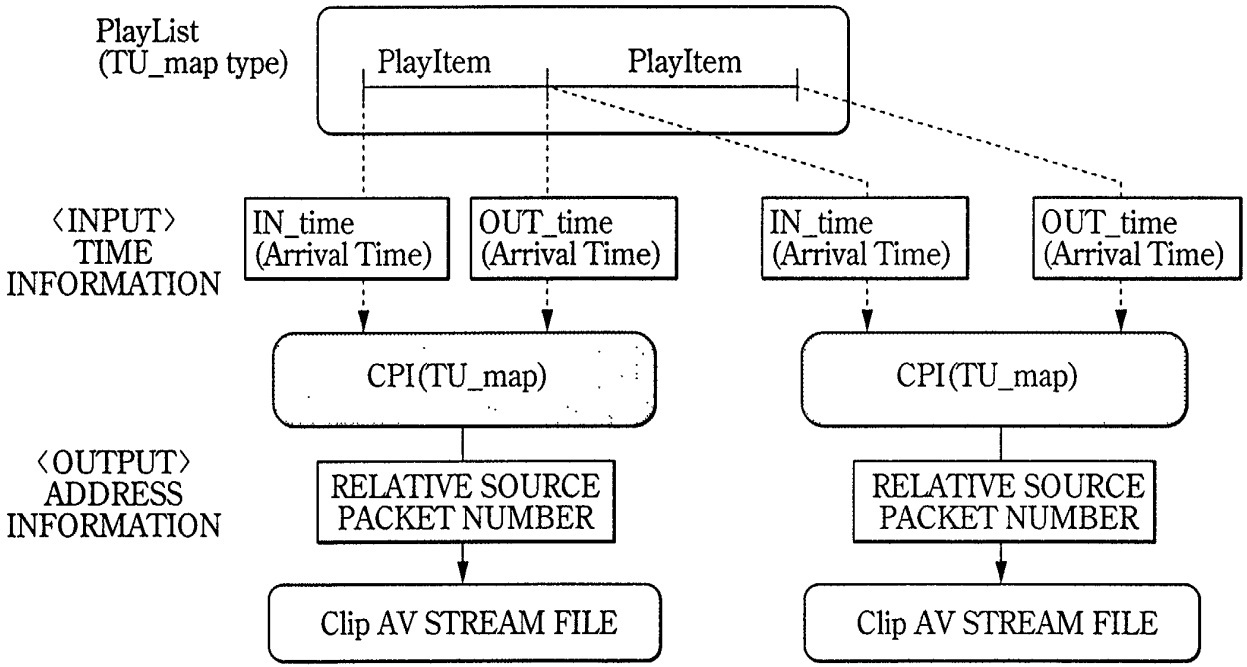
PlayList
(TU_map type)
PlayItem
PlayItem
〈INPUT〉
TIME
INFORMATION
IN_time
(Arrival Time)
OUT_time
(Arrival Time)
IN_time
(Arrival Time)
OUT_time
(Arrival Time)
CPI(TU_map)
CPI(TU_map)
〈OUTPUT〉
ADDRESS
INFORMATION
RELATIVE SOURCE
PACKET NUMBER
RELATIVE SOURCE
PACKET NUMBER
Clip AV STREAM FILE
Clip AV STREAM FILE

FIG.64

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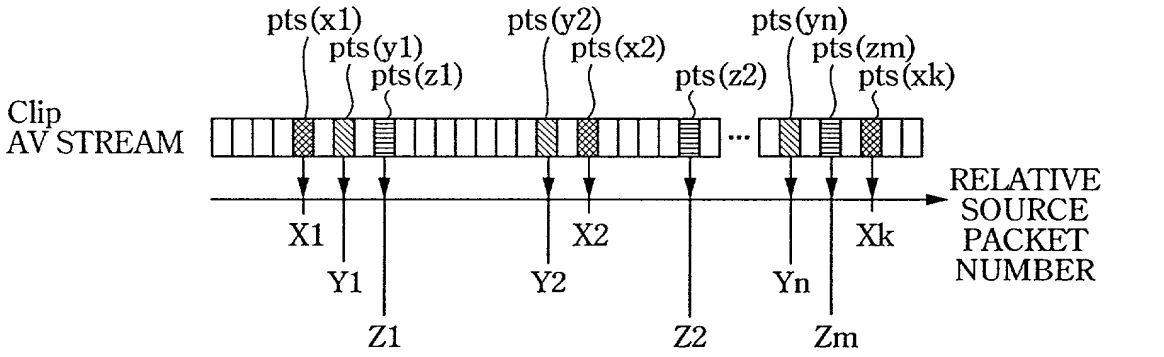
SYNTAX	NUMBER OF BYTES	ABBREVIATION
CPI(){		
version_number	8*4	bslbf
length	32	uimsbf
reserved	15	bslbf
CPI_type	1	bslbf
if (CPI_type==0)		
EP_map()		
else		
TU_map()		
}		

FIG.65

CPI_type	MEANING
0	EP map type
1	TU map type

FIG.66



EP_map

number_of_stream/PIDs=3

EP_map_for_ one_stream_PID(0)

stream_PID(0)=x
num_EP_entries(0)=k

PTS_EP start	RSPN_EP start
pts(x1)	X1
pts(x2)	X2
...	...
pts(xk)	Xk

EP_map_for_ one_stream_PID(1)

stream_PID(1)=y
num_EP_entries(1)=n

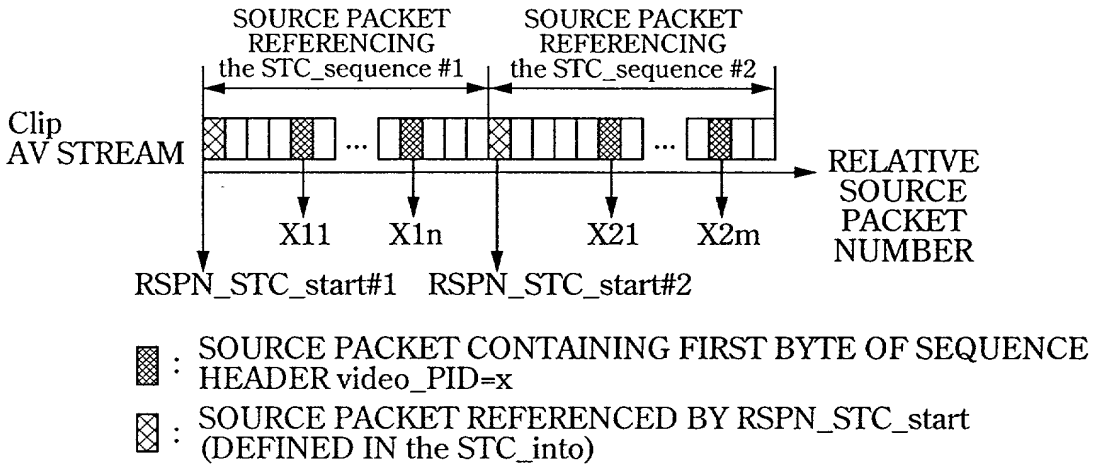
PTS_EP start	RSPN_EP start
pts(y1)	Y1
pts(y2)	Y2
...	...
pts(yn)	Yn

EP_map_for_ one_stream_PID(2)

stream_PID(2)=z
num_EP_entries(2)=m

PTS_EP start	RSPN_EP start
pts(z1)	Z1
pts(z2)	Z2
...	...
pts(zm)	Zm

FIG.67



EP_map_for_one_steram_ PID
video_PID=x

PTS_EP start	RSPN_EP start	
pts(x11)	X11	DATA BELONGING TO STC_sequence #1
...	...	
pts(x1n)	X1n	
		boundary
pts(x21)	X21	DATA BELONGING TO STC_sequence #2
...	...	
pts(x2m)	X2m	

RSPN_STC_start #2<X21

FIG.68

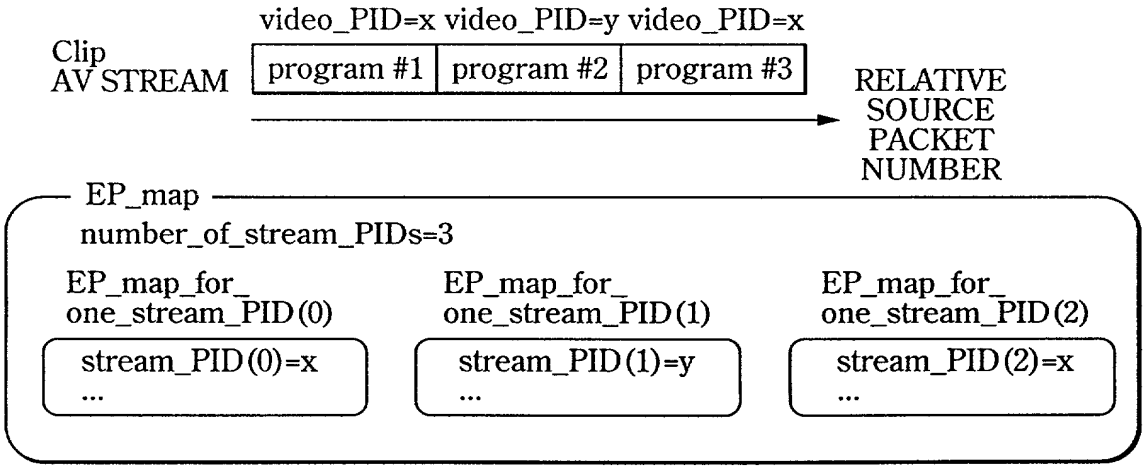


FIG.69

SYNTAX	NUMBER OF BYTES	ABBREVIATION
EP_map(){		
reserved	12	bslbf
EP_type	4	uimsbf
number_of_stream_PIDs	16	uimsbf
for (k=0;k<*number_of_stream_PIDs*;k++){		
stream_PID(*k*)	16	bslbf
num_EP_entries(*k*)	32	uimsbf
EP_map_for_one_stream_PID_Start_address(*k*)	32	uimsbf
}		
for (i=0;i<X;i++){		
padding_word	16	bslbf
}		
for (k=0;k<*number_of_stream_PIDs*;k++){		
EP_map_for_one_stream_PID(*num_EP_entries(k)*)		
for (i=0;i<Y;i++){		
padding_word	16	bslbf
}		
}		
}		

FIG.70

EP_type	MEANING
0	video
1	audio
2-15	reserved

FIG.71

EPO - DG 1 - 05. 11. 2001

SYNTAX	NUMBER OF BYTES	ABBREVIATION
EP_map_for_one_stream_PID(*N*) {		
for (i=0;i<*N*;i++){		
PTS_EP_start	32	uimsbf
RSPN_EP_start	32	uimsbf
}		
}		

FIG.72

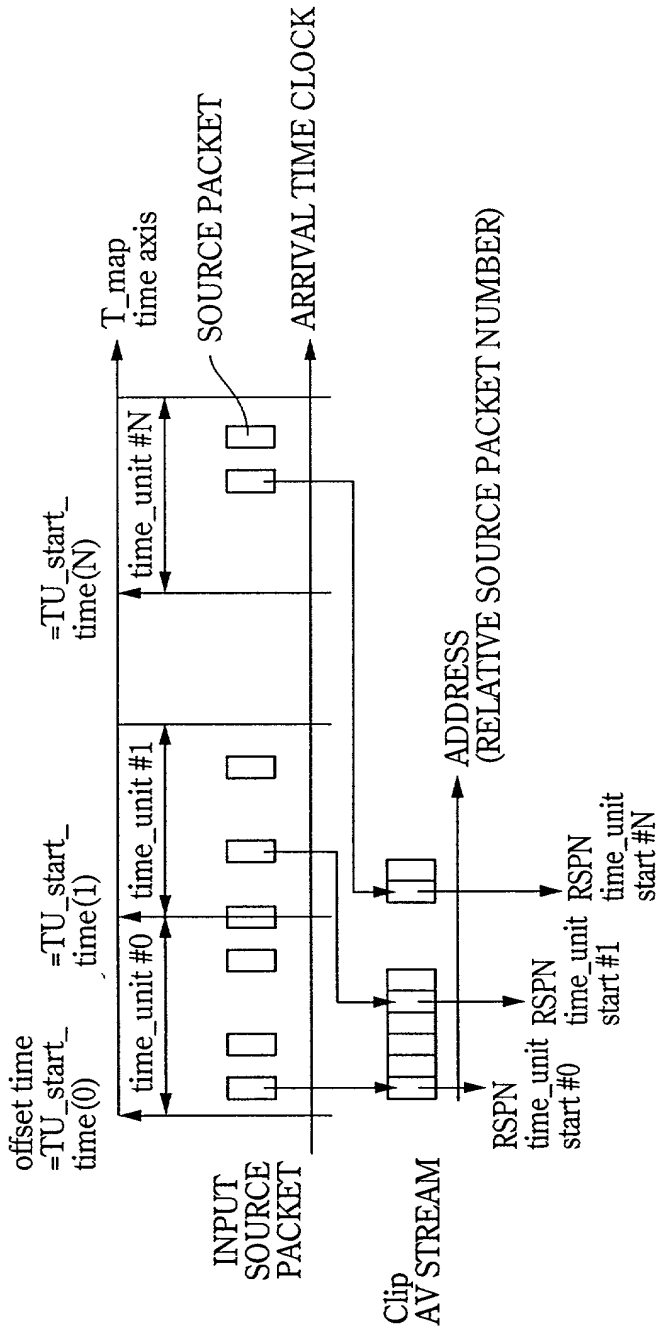

offset time
=TU_start_
time(0)
=TU_start_
time(1)
=TU_start_
time(N)
T_map
time axis
SOURCE PACKET
ARRIVAL TIME CLOCK
time_unit #0
time_unit #1
time_unit #N
INPUT
SOURCE
PACKET
Clip
AV STREAM
ADDRESS
(RELATIVE SOURCE PACKET NUMBER)
RSPN
time_unit
start #0
RSPN
time_unit
start #1
RSPN
time_unit
start #N

FIG.73

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SYNTAX	NUMBER OF BYTES	ABBREVIATION
TU_map() {		
offset_time	32	bslbf
time_unit_size	32	uimsbf
number_of_time_unit_entries	32	uimsbf
for (k=0;k<*number_of_time_unit_entries*;k++)		
RSPN_time_unit_start	32	uimsbf
}		

FIG.74

SYNTAX	NUMBER OF BYTES	ABBREVIATION
ClipMark(){		
version_number	8*4	bslbf
length	32	uimsbf
number_of_Clip_marks	16	uimsbf
for (i=0; i<*number_of_clip_marks*; i++){		
reserved	8	bslbf
mark_type	8	bslbf
mark_time_stamp	32	uimsbf
STC_sequence_id	8	uimsbf
reserved	24	bslbf
character_set	8	bslbf
name_length	8	uimsbf
mark_name	8*256	bslbf
ref_thumbnail_index	16	uimsbf
}		
}		

FIG.75

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EP0109837A1

Mark_type	MEANING	COMMENT
0x00-0x8F	reserved	Reserved for PlayListMark0
0x90	Event-start mark	MARK POINT INDICATING PROGRAM START POINT
0x91	Local event-start mark	MARK POINT INDICATING LOCAL SCENE IN PROGRAM
0x92	Scene-start mark	MARK POINT SHOWING SCENE CHANGE POINT
0x93-0xFF	reserved	

FIG.76

CPI_type in the PlayList()	SEMANTICS OF mark_time_stamp
EP_map type	mark_time_stamp MUST INDICATE UPPER 32 BITS OF 33 BIT LENGTH PTS CORRESPONDING TO PRESENTATION UNIT REFERENCED BY MARK.
TU_map type	mark_time_stamp MUST BE TIME ON TU_map_time_axis AND MUST BE ROUNDED TO time_unit PRECISION. mark_time_stamp IS CALCULATED BY FOLLOWING EQUATION: $mark_time_stamp = TU_start_time \%2^{32}$

FIG.77

SYNTAX	NUMBER OF BYTES	ABBREVIATION
menu.thmb/mark.thmb {		
reserved	256	bslbf
Thumbnail()		
for (i=0; i<N1; i++)		
padding_word	16	bslbf
}		

FIG.78

SYNTAX	NUMBER OF BYTES	ABBREVIATION
Thumbnail(){		
version_number	8*4	char
length	32	uimsbf
if (length !=0){		
tn_blocks_start_address	32	bslbf
number_of_thumbnails	16	uimsbf
tn_block_size	16	uimsbf
number_of_tn_blocks	16	uimsbf
reserved	16	bslbf
for (i=0; i<*number_of_thumbnails*; i++){		
thumbnail_index	16	uimsbf
thumbnail_picture_format	8	bslbf
reserved	8	bslbf
picture_data_size	32	uimsbf
start_tn_block_number	16	uimsbf
x_picture_length	16	uimsbf
y_picture_length	16	uimsbf
reserved	16	uimsbf
}		
stuffing_bytes	8*2*L1	bslbf
for(k=0; k<*number_of_tn_blocks*; k++){		
tn_block	tn_block_ size*1024*8	
}		
}		
}		

FIG.79

Thumbnail_picture_format	MEANING
0x00	MPEG-2 Video I-picture
0x01	DCF (restricted JPEG)
0x02	PNG
0x03-0xff	reserved

FIG.80

FIG.81A

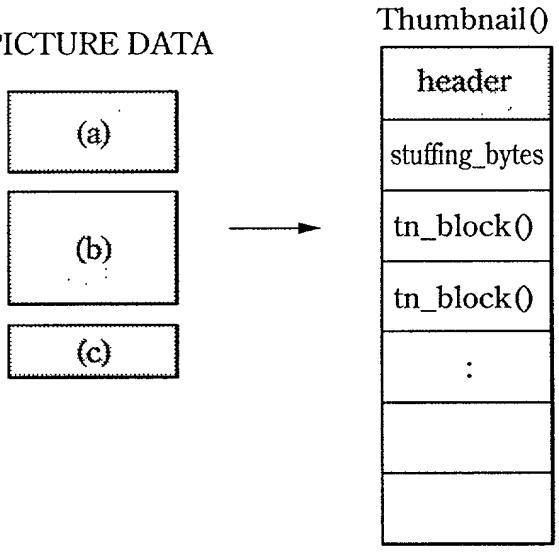
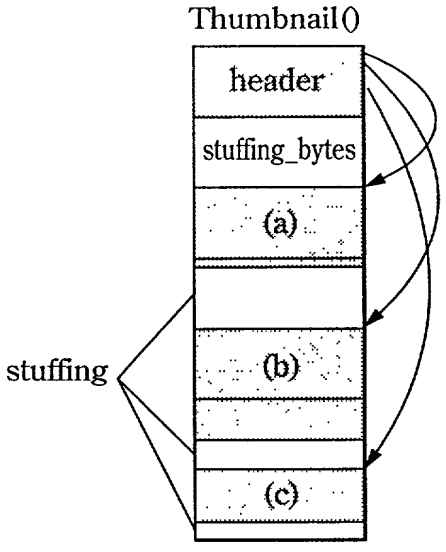


FIG.81 B



replacement sheet

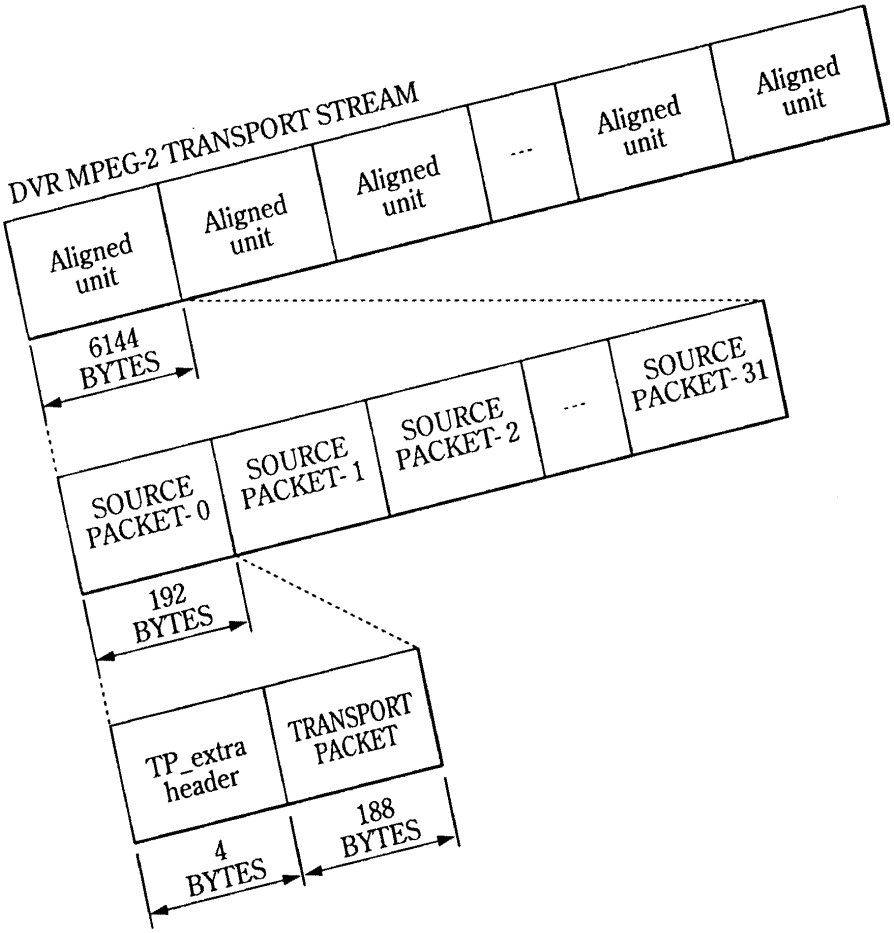

DVR MPEG-2 TRANSPORT STREAM
Aligned unit
Aligned unit
Aligned unit
...
Aligned unit
Aligned unit
6144 BYTES
SOURCE PACKET-0
SOURCE PACKET-1
SOURCE PACKET-2
...
SOURCE PACKET-31
192 BYTES
TP_extra header
TRANSPORT PACKET
4 BYTES
188 BYTES

FIG.82

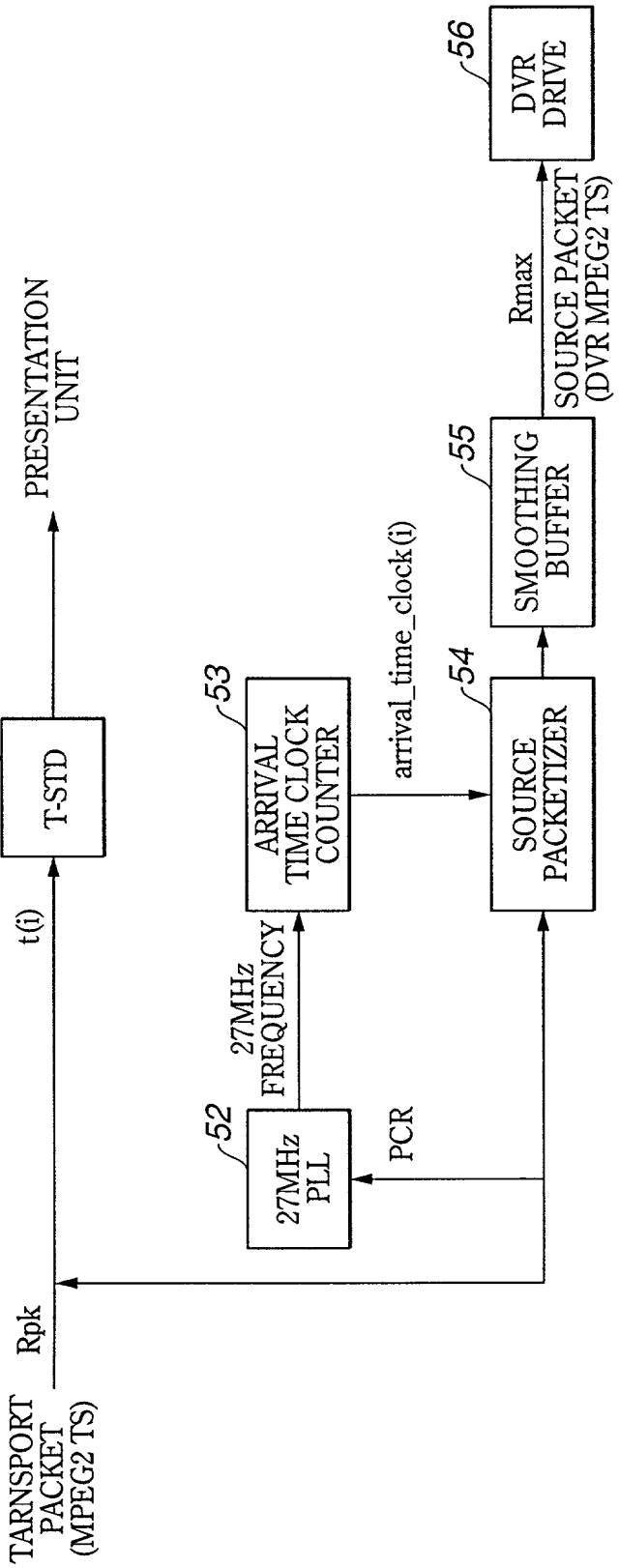

TARNSPORT PACKET (MPEG2 TS)
Rpk
t(i)
51
T-STD
PRESENTATION UNIT
52
27MHz PLL
27MHz FREQUENCY
PCR
53
ARRIVAL TIME CLOCK COUNTER
arrival_time_clock(i)
54
SOURCE PACKETIZER
55
SMOOTHING BUFFER
Rmax
SOURCE PACKET (DVR MPEG2 TS)
56
DVR DRIVE

FIG.83

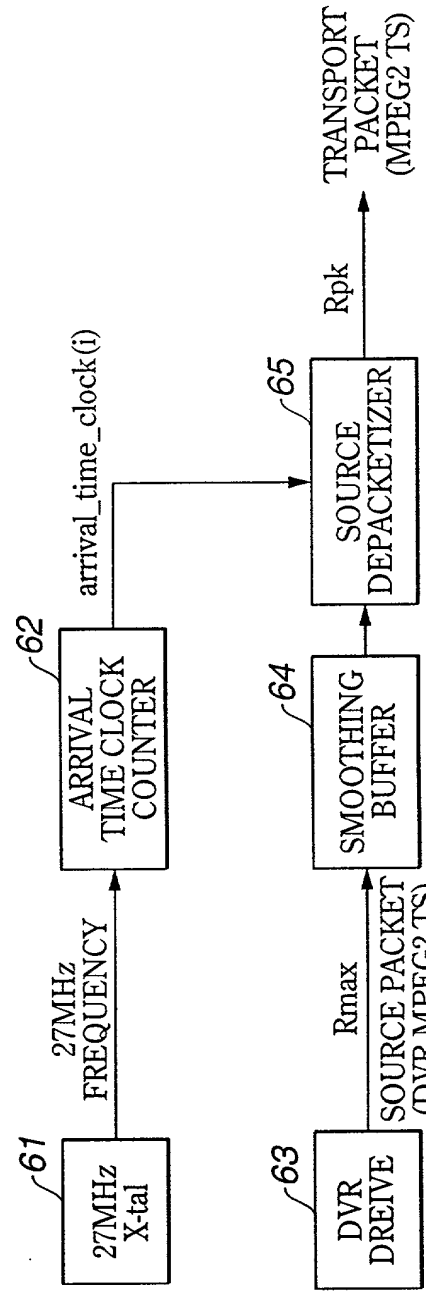

61
27MHz
X-tal
27MHz
FREQUENCY
62
ARRIVAL
TIME CLOCK
COUNTER
arrival_time_clock(i)
63
DVR
DREIVE
Rmax
SOURCE PACKET
(DVR MPEG2 TS)
64
SMOOTHING
BUFFER
65
SOURCE
DEPACKETIZER
Rpk
TRANSPORT
PACKET
(MPEG2 TS)

FIG.84

SYNTAX	NUMBER OF BYTES	ABBREVIATION
source_packet() {		
TP_extra_header()		
transport_packet()		
}		

FIG.85

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SYNTAX	NUMBER OF BYTES	ABBREVIATION
TP_extra_header() {		
copy_permission_indicator	2	uimsbf
arrival_time_stamp	30	uimsbf
}		

FIG.86

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copy_permission _indicator	MEANING
00	copy free
01	no more copy
10	copy once
11	copy prohibited

FIG.87

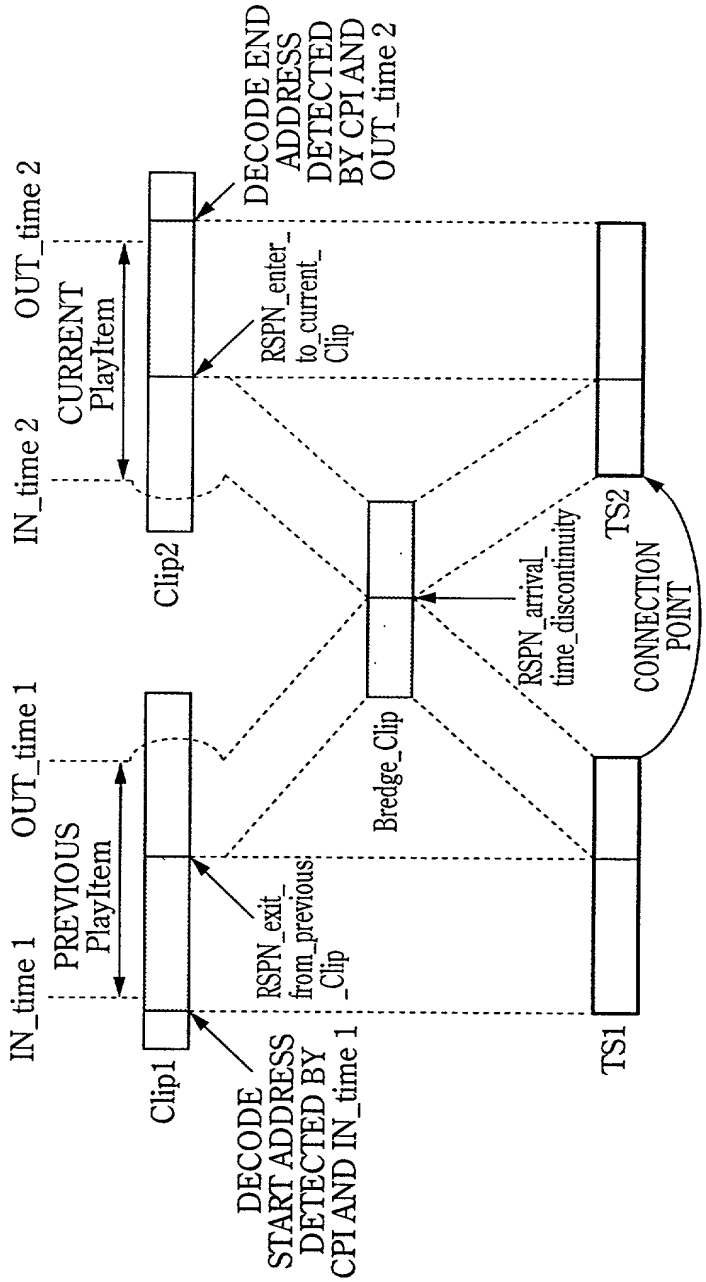
IN_time 1
OUT_time 1
PREVIOUS PlayItem
IN_time 2
OUT_time 2
CURRENT PlayItem
Clip1
Clip2
Bredge_Clip
TS1
TS2
RSPN_exit_ from_previous _Clip
RSPN_enter_ to_current_ Clip
RSPN_arrival_ time_discontinuity
CONNECTION POINT
DECODE START ADDRESS DETECTED BY CPI AND IN_time 1
DECODE END ADDRESS DETECTED BY CPI AND OUT_time 2

FIG.88

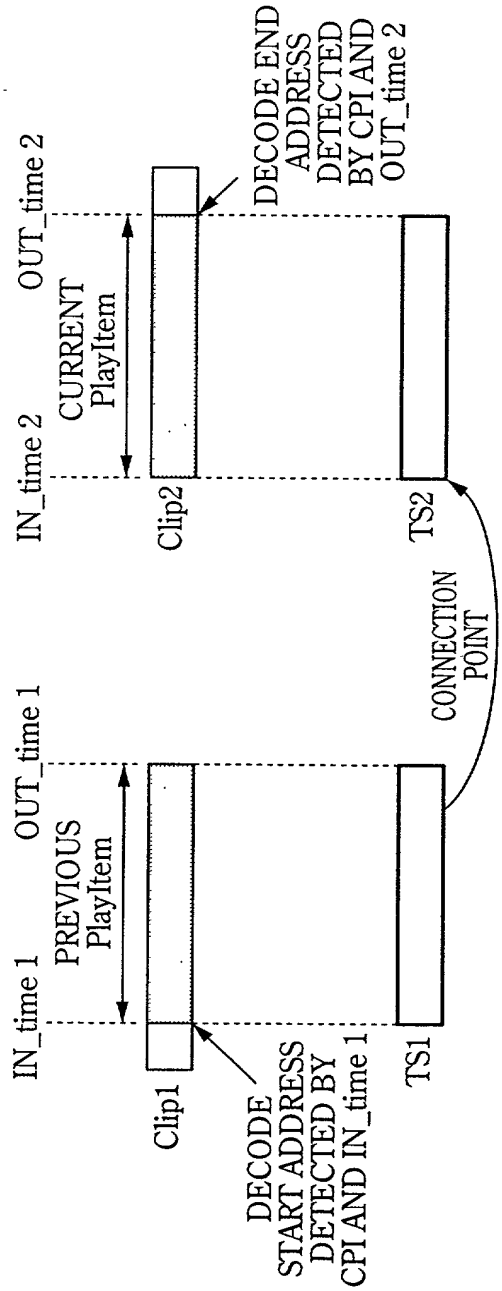
IN_time 1
OUT_time 1
PREVIOUS PlayItem
IN_time 2
OUT_time 2
CURRENT PlayItem
Clip1
Clip2
TS1
TS2
CONNECTION POINT
DECODE START ADDRESS DETECTED BY CPI AND IN_time 1
DECODE END ADDRESS DETECTED BY CPI AND OUT_time 2

FIG.89

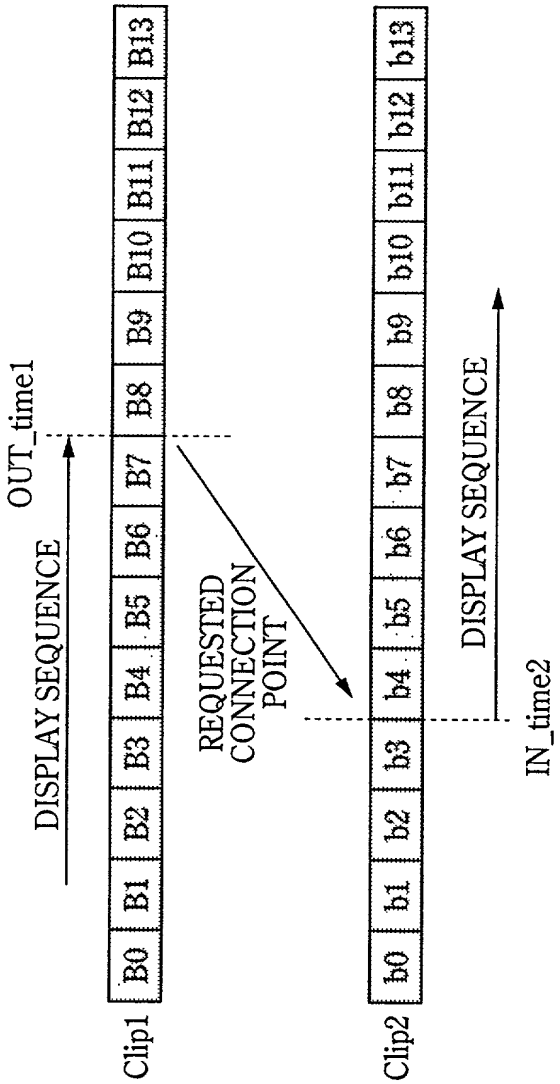
Clip1
B0
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11
B12
B13
DISPLAY SEQUENCE
OUT_time1
REQUESTED CONNECTION POINT
Clip2
b0
b1
b2
b3
b4
b5
b6
b7
b8
b9
b10
b11
b12
b13
DISPLAY SEQUENCE
IN_time2

FIG.90

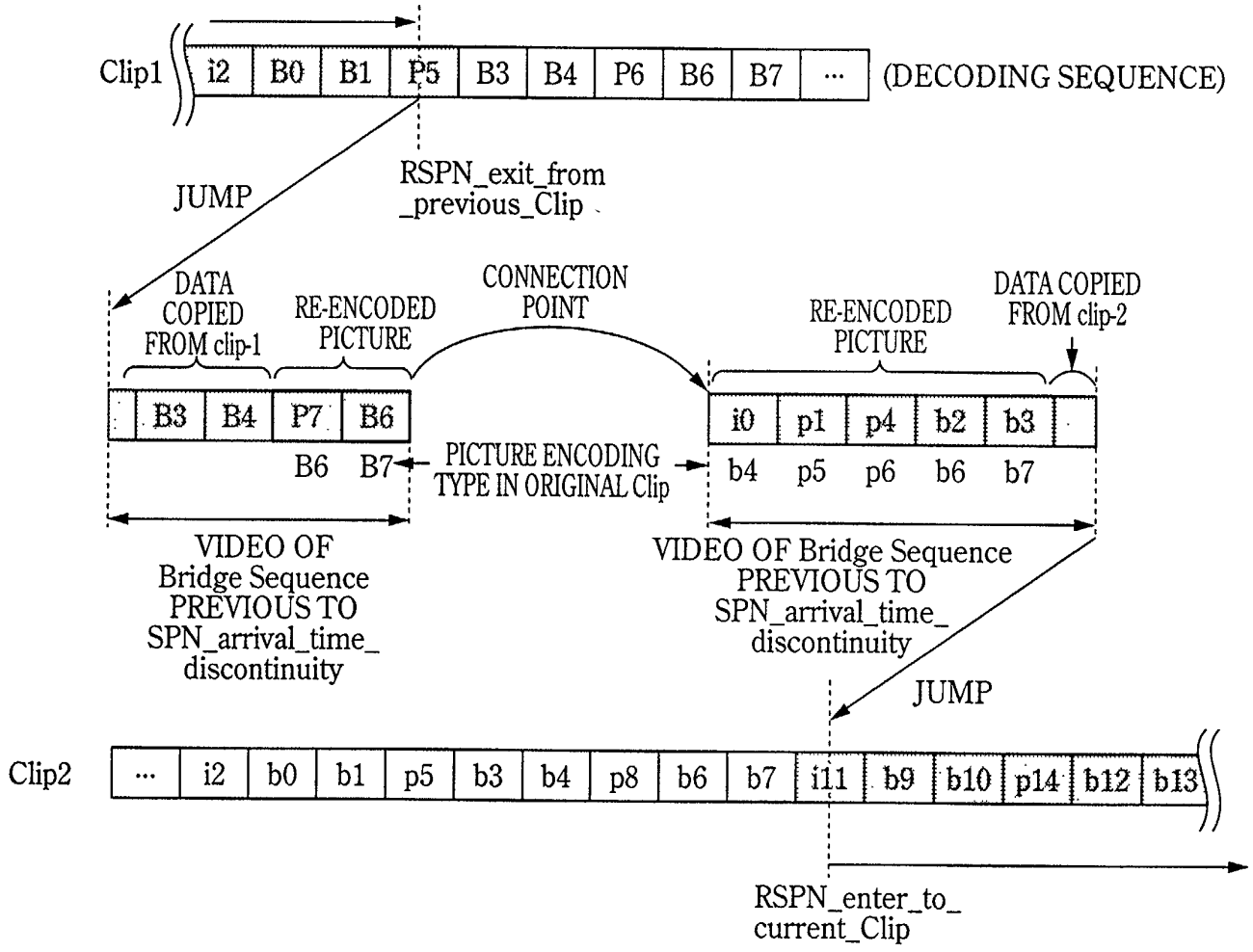
Clip1
i2
B0
B1
P5
B3
B4
P6
B6
B7
...
(DECODING SEQUENCE)
JUMP
RSPN_exit_from
_previous_Clip
DATA
COPIED
FROM clip-1
RE-ENCODED
PICTURE
CONNECTION
POINT
RE-ENCODED
PICTURE
DATA COPIED
FROM clip-2
B3
B4
P7
B6
i0
p1
p4
b2
b3
B6
B7
PICTURE ENCODING
TYPE IN ORIGINAL Clip
b4
p5
p6
b6
b7
VIDEO OF
Bridge Sequence
PREVIOUS TO
SPN_arrival_time_
discontinuity
VIDEO OF Bridge Sequence
PREVIOUS TO
SPN_arrival_time_
discontinuity
JUMP
Clip2
...
i2
b0
b1
p5
b3
b4
p8
b6
b7
i11
b9
b10
p14
b12
b13
RSPN_enter_to_
current_Clip

FIG.91

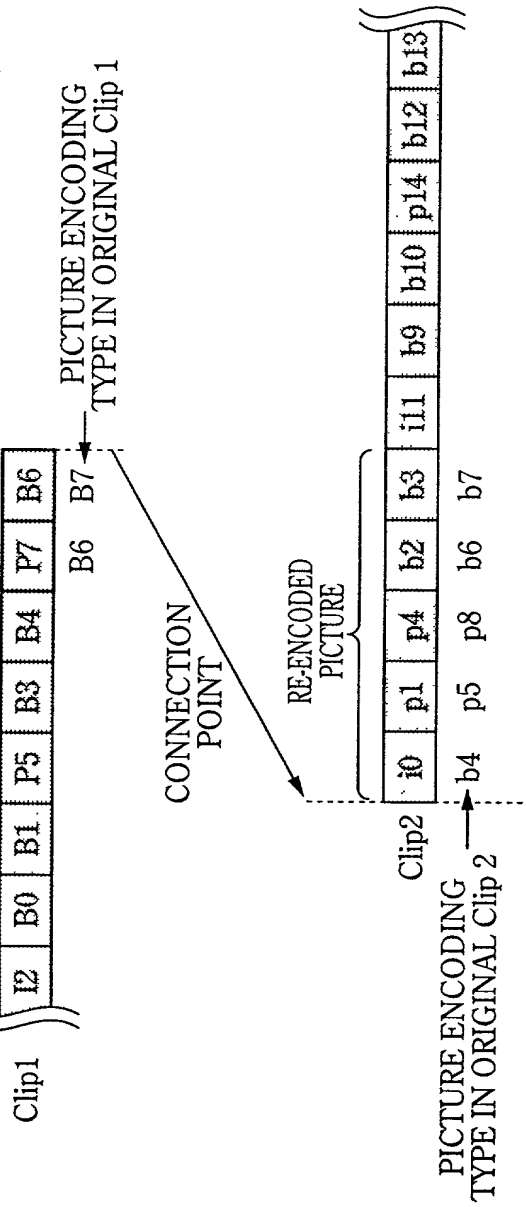
Clip1
(DECODING SEQUENCE)
I2
B0
B1
P5
B3
B4
P7
B6
RE-ENCODED PICTURE
B6
B7
PICTURE ENCODING TYPE IN ORIGINAL Clip 1
CONNECTION POINT
Clip2
PICTURE ENCODING TYPE IN ORIGINAL Clip 2
i0
p1
p4
b2
b3
i11
b9
b10
p14
b12
b13
RE-ENCODED PICTURE
b4
p5
p8
b6
b7

FIG.92

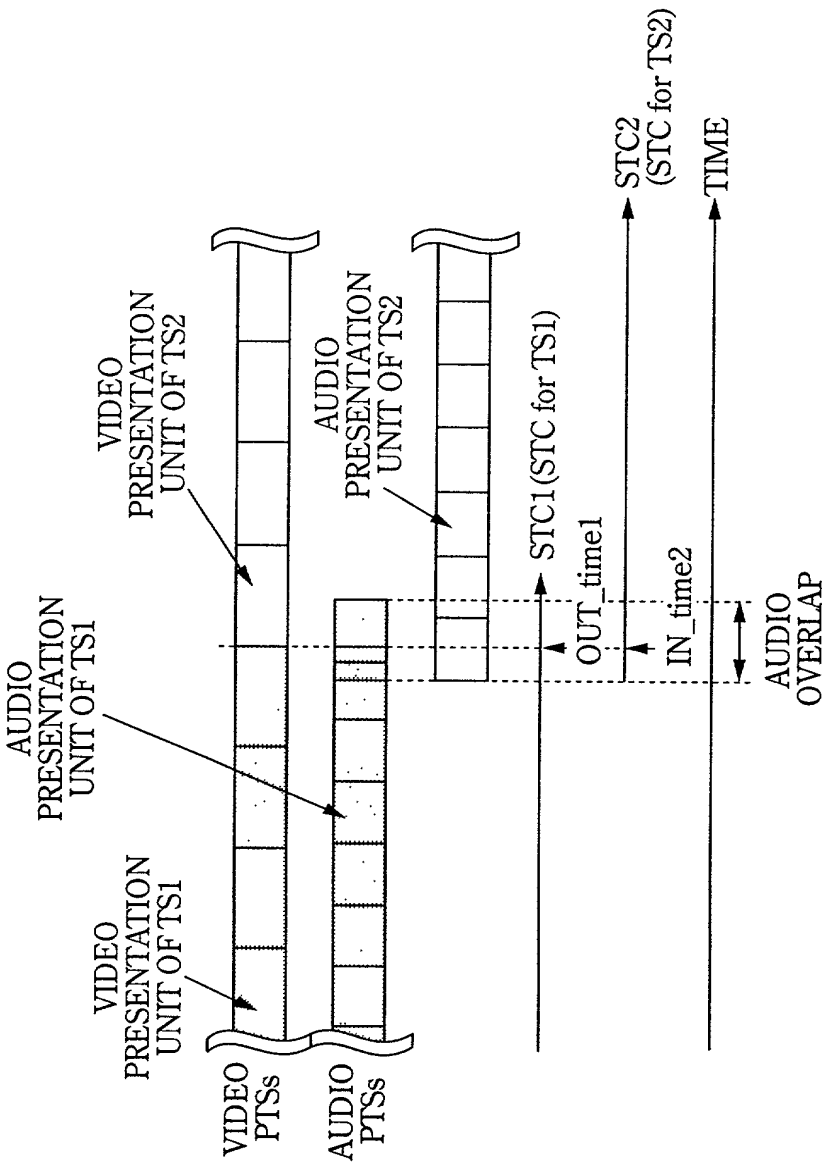
VIDEO PRESENTATION UNIT OF TS1
AUDIO PRESENTATION UNIT OF TS1
VIDEO PRESENTATION UNIT OF TS2
AUDIO PRESENTATION UNIT OF TS2
VIDEO PTSs
AUDIO PTSs
STC1(STC for TS1)
OUT_time1
IN_time2
AUDIO OVERLAP
STC2 (STC for TS2)
TIME

FIG.93

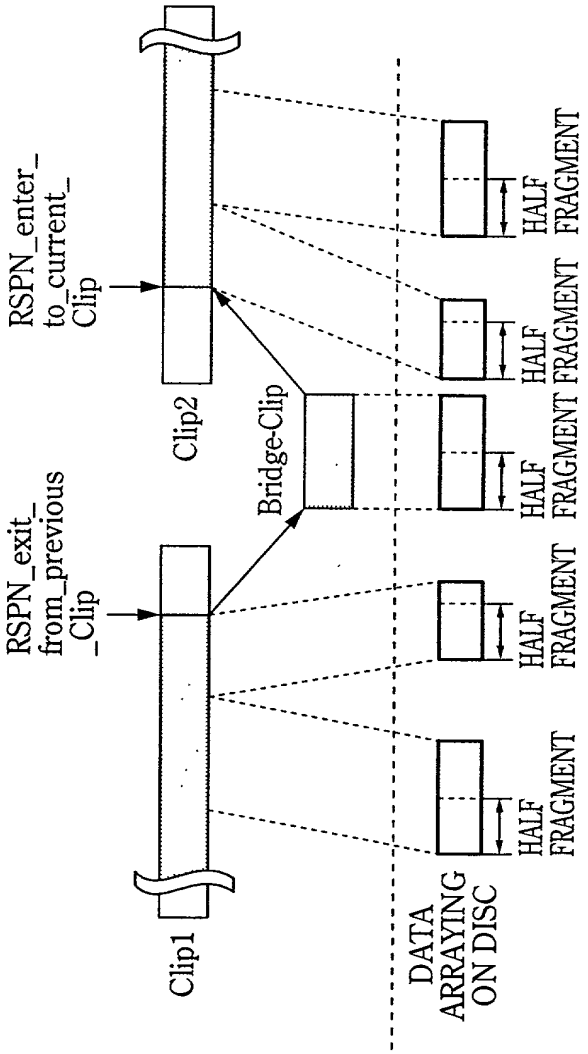
RSPN_enter_
to_current_
Clip
RSPN_exit_
from_previous
_Clip
Clip2
Bridge-Clip
Clip1
DATA
ARRAYING
ON DISC
HALF
FRAGMENT
HALF
FRAGMENT
HALF
FRAGMENT
HALF
FRAGMENT
HALF
FRAGMENT

FIG.94

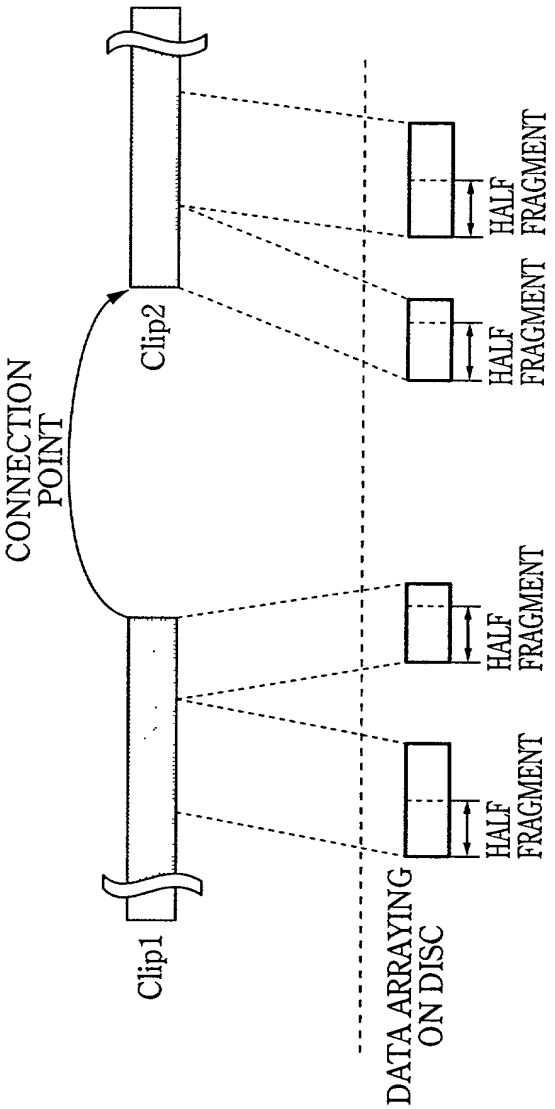
CONNECTION POINT
Clip2
Clip1
HALF FRAGMENT
HALF FRAGMENT
HALF FRAGMENT
HALF FRAGMENT
DATA ARRAYING ON DISC

FIG.95

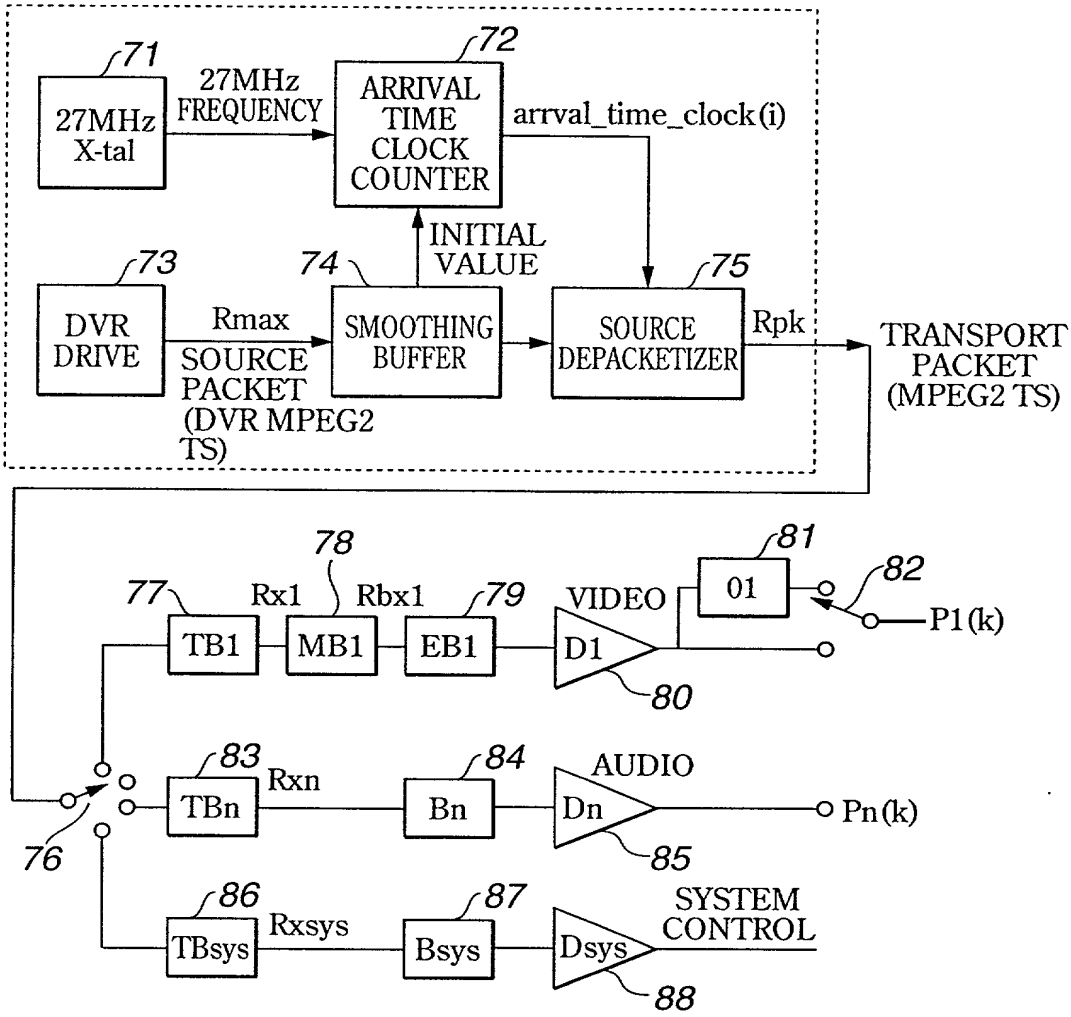
71
27MHz X-tal
27MHz FREQUENCY
72
ARRIVAL TIME CLOCK COUNTER
arrval_time_clock(i)
INITIAL VALUE
73
DVR DRIVE
Rmax
SOURCE PACKET (DVR MPEG2 TS)
74
SMOOTHING BUFFER
75
SOURCE DEPACKETIZER
Rpk
TRANSPORT PACKET (MPEG2 TS)
78
77
Rx1
Rbx1
79
TB1
MB1
EB1
VIDEO
D1
80
81
01
82
P1(k)
76
83
TBn
Rxn
84
Bn
AUDIO
Dn
85
Pn(k)
86
TBsys
Rxsys
87
Bsys
Dsys
SYSTEM CONTROL
88

FIG.96

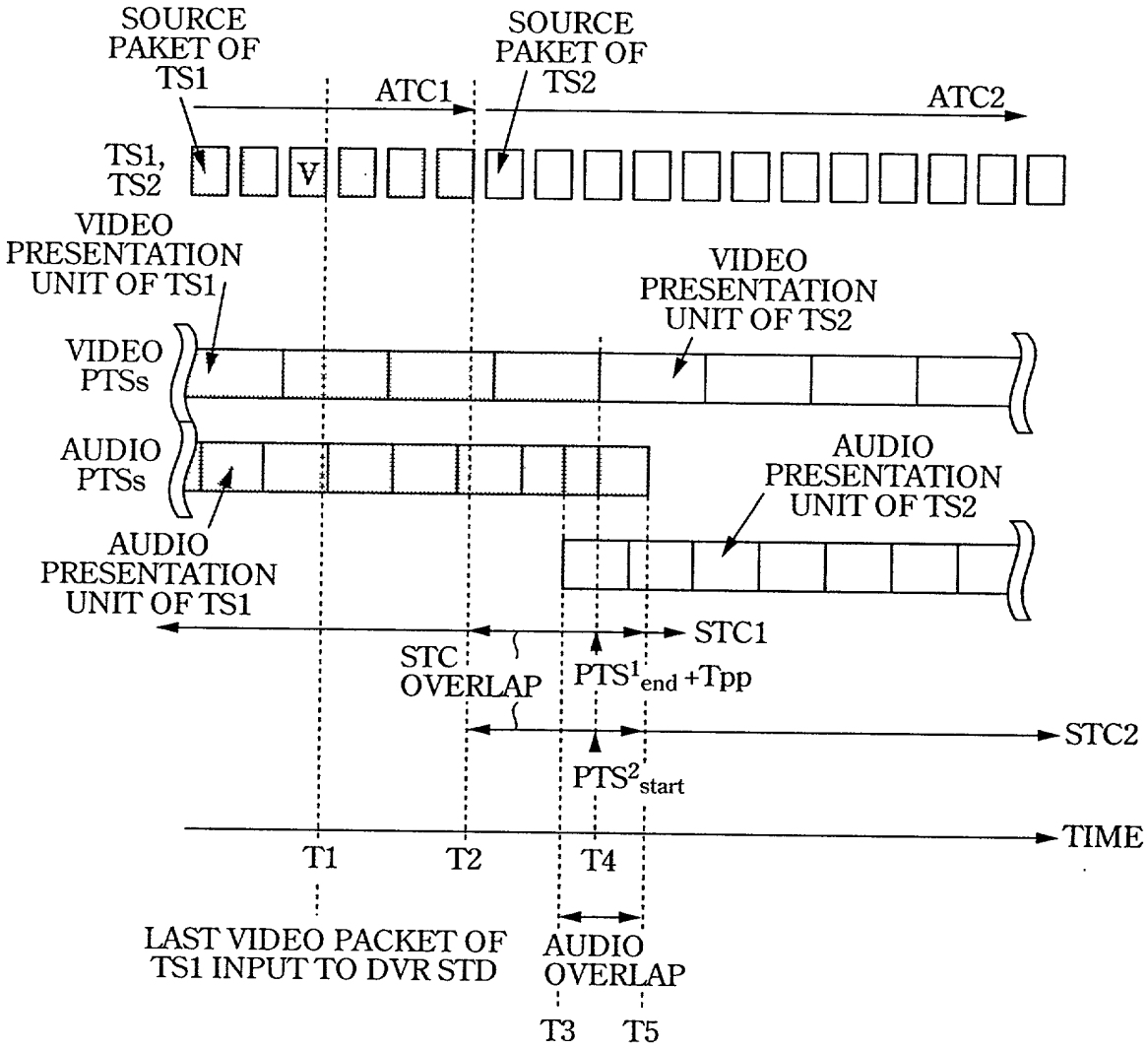
SOURCE PAKET OF TS1
SOURCE PAKET OF TS2
ATC1
ATC2
TS1, TS2
V
VIDEO PRESENTATION UNIT OF TS1
VIDEO PRESENTATION UNIT OF TS2
VIDEO PTSs
AUDIO PTSs
AUDIO PRESENTATION UNIT OF TS2
AUDIO PRESENTATION UNIT OF TS1
STC1
STC OVERLAP
PTS1end +Tpp
STC2
PTS2start
TIME
T1
T2
T4
LAST VIDEO PACKET OF TS1 INPUT TO DVR STD
AUDIO OVERLAP
T3
T5

FIG.97

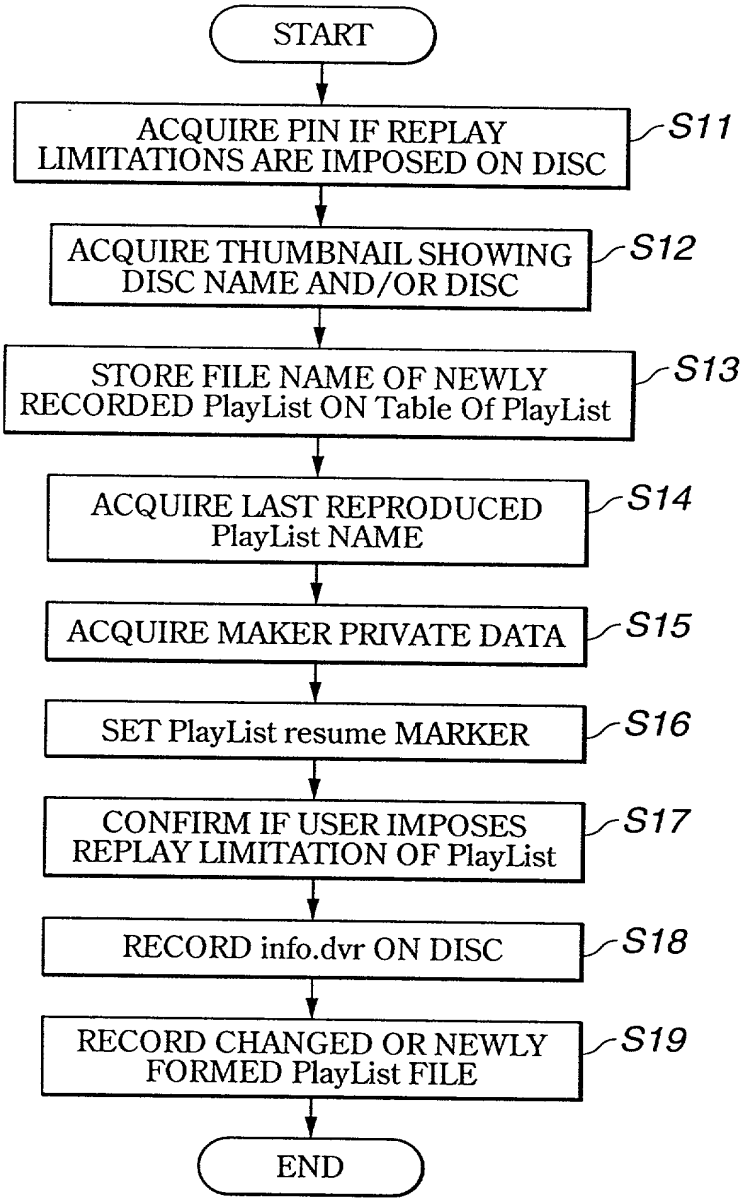

FIG.98

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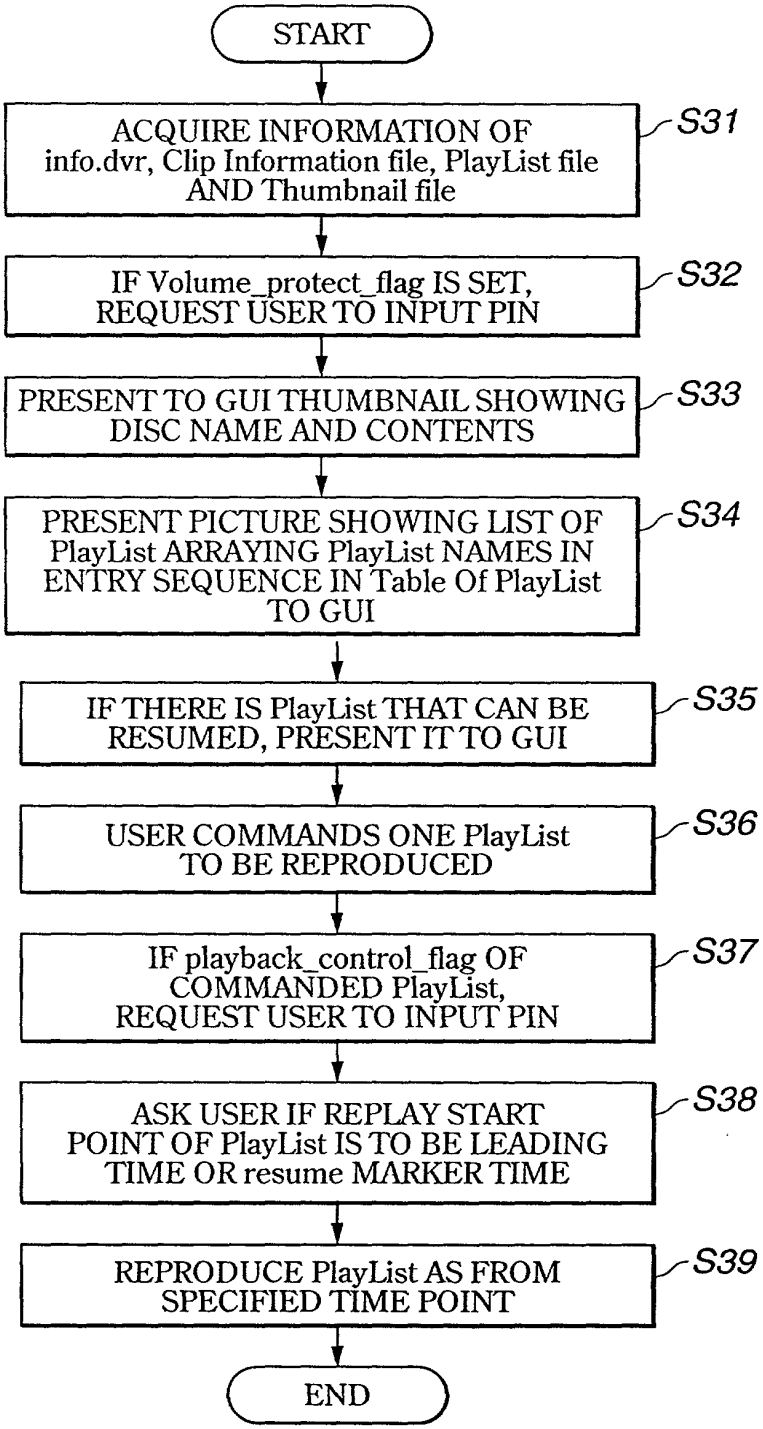

FIG.99

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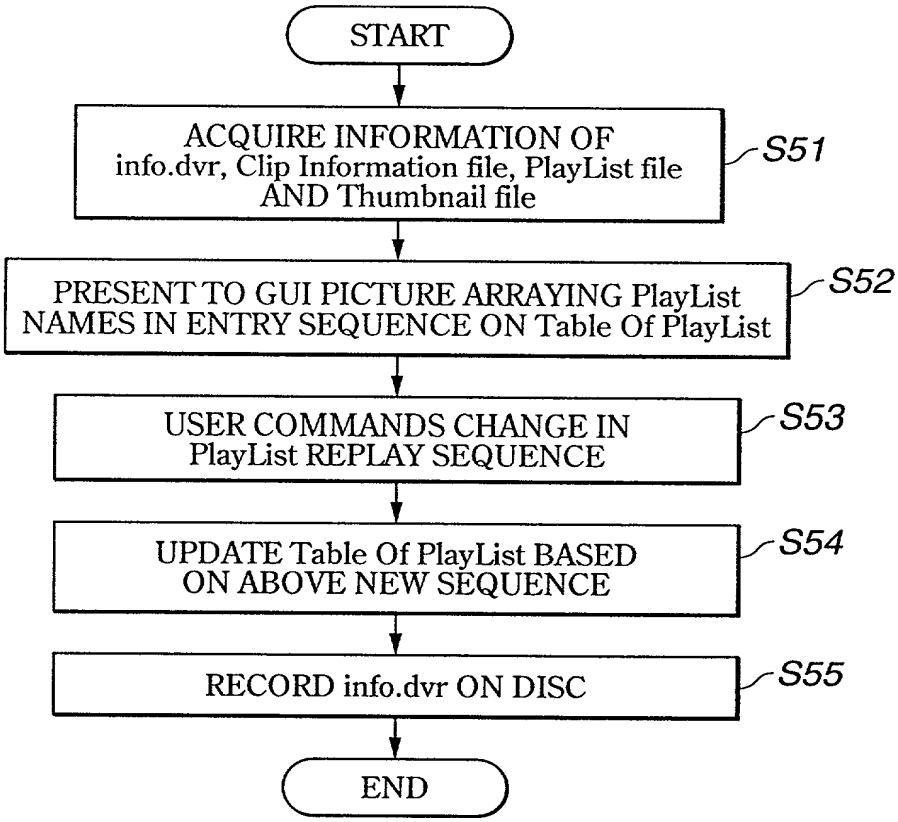

FIG.100

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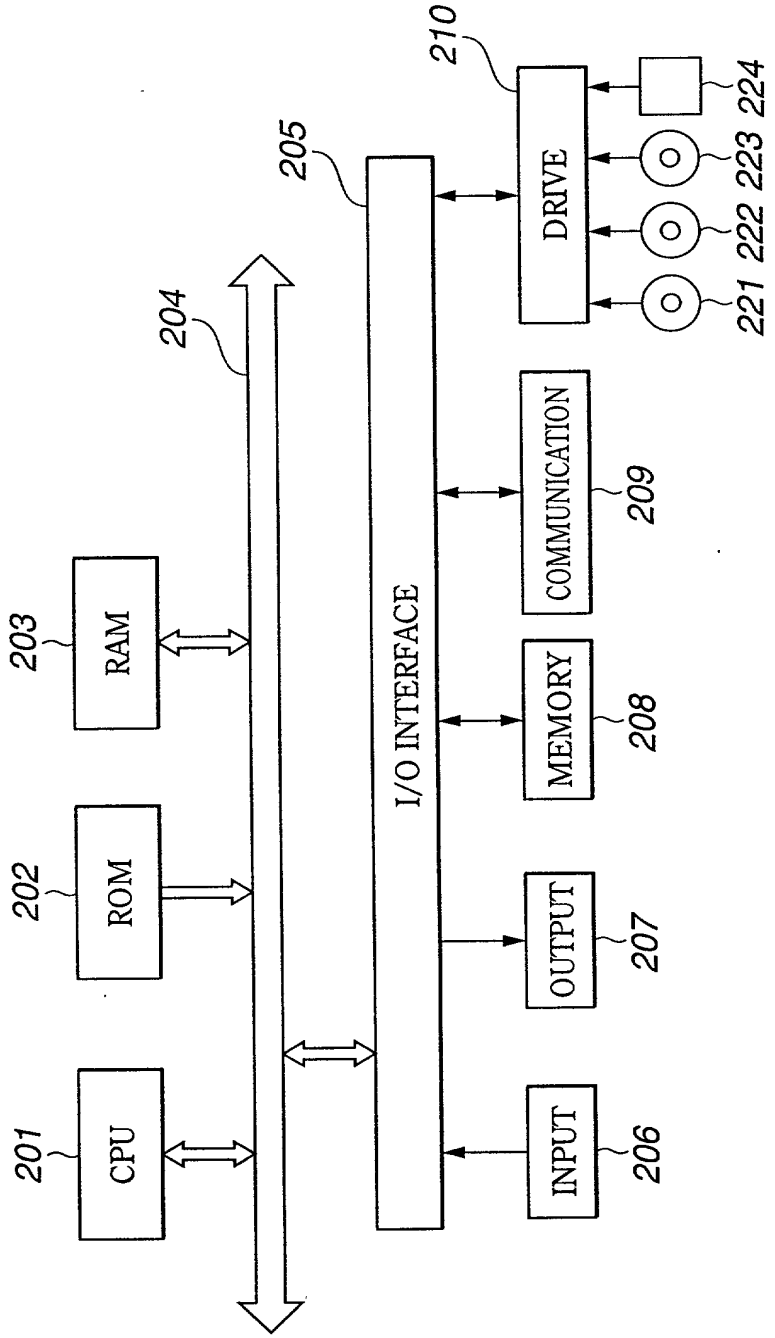
201
CPU
202
ROM
203
RAM
204
205
I/O INTERFACE
206
INPUT
207
OUTPUT
208
MEMORY
209
COMMUNICATION
210
DRIVE
221
222
223
224

FIG.101